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THE RESTORATION OF DRIED TISSUES, WITH ESPECIAL REFERENCE TO HUMAN REMAINS

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I. — PRELIMINARY EXPERIMENTS

Two or three years ago, while engaged in the preparation of embryonic skeletons after the Schultze method, I was struck with the rapidity with which the specimens, after the preliminary shrinking in alcohol, reassumed their normal size and shape when put into the 3% solution of caustic potash. This led naturally to the question whether the last-named fluid might exert a similar influence upon a tissue deprived of its water by simply drying in the air, and I was thus led to drop into a jar of potash solution a very dry and flattened specimen of a frog, which had been for some months on my desk. This simple experiment was performed one night while I was leaving the laboratory and appeared of so little importance that I had for the moment quite forgotten the incident when on my return the following morning I found what seemed at first a perfectly normal frog floating in a natural attitude upon the surface of the liquid. In the dried condition it had been impossible to determine the species of the specimen, and in fact I had supposed it to be not a frog at all, but a toad; yet after the restoration, every external marking was distinct, and even the colors were in part restored, showing it at once to be *Rana clamitans*. From this time on the specimen continued to imbibe the liquid until within a few more hours it appeared slightly abnormal. The skin was smooth and tense, especially over fleshy regions like the thigh,

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thus suggesting that the muscles absorbed the liquid more greedily than did the other tissues. To check this action, the frog was then thrown into water, a procedure which proved disastrous, since the bloating, instead of being checked, appeared to be accelerated, until finally the skin over the much-distended thighs burst outward by longitudinal rents, from which the muscles protruded as semi-transparent, almost gelatinous masses. Whether the bursting was due to the use of the water, or whether the potash was removed too late to check the process already far under way, I cannot state definitely, but later experiments with all sorts of dried tissues have given me the impression that the former is the case, and that, after the potash solution has exhausted its power, an immersion in water will cause further distension.

This experiment with the frog was followed, as occasion offered, by similar ones performed upon other frogs, a turtle, an earthworm and a few other invertebrate specimens, of which some had been dried in the sun when fresh, while the rest were preserved material from which the alcohol had evaporated, and in all cases the results were exceedingly interesting and furnished specimens of actual value for many lines of investigation. The frogs and the turtle permitted careful dissection, and most of the organs were of normal or nearly normal appearance, the nerves being especially good, thus suggesting the employment of some method of desiccation for the preservation of specimens obtained during expeditions in regions where the employment of the ordinary preservatives is impracticable.

In connection with these experiments the thought naturally occurred to me that this method might also be applicable to some or all of the various forms of dried human remains, even to those of considerable antiquity, since after desiccation is once complete the lapse of time would cause but little further change, and the success of such an experiment would depend mainly on the amount of tissue that had resisted decay before the completion of the drying process more than on the actual age of the mummy.

Through the kindness of Prof. F. W. Putman of the Peabody Museum at Cambridge, Mass., I was supplied with a little preliminary material with which to make a test, since which, both from him

and from his former associate, Dr Aleš Hrdlička, then of the American Museum of Natural History, New York, and now of the United States National Museum, I have received a most liberal supply of human remains, illustrating various methods of treatment, and especially well fitted to show the capabilities of the method. I wish to take this opportunity of expressing to them my gratitude for their kindness and practical interest in the matter. I wish also to acknowledge my indebtedness to the other teachers in my department, who have interested themselves in the work, and have furnished me valuable assistance, both in the practical treatment of the material, the microscopic investigation, and in the taking of the photographs which illustrate this article.

I can best set forth the results of these various experiments in the form of a report, taking up the cases in the order of treatment; but before attempting this, I will present a description of the method as it became elaborated during the progress of the work.

II.—THE METHOD

1. The essential reagent is caustic potash, applied in a solution of 1–3%. The dried object is placed at once in a tank of this fluid and held beneath the surface for a few moments, until the entire surface becomes wet. At first the specimen will float on the surface, but as it imbibes more and more of the fluid it will gradually sink. Within a short time, even in a few minutes, the liquid will become so dark-colored that the specimens cannot be readily seen, and it will be better to change the fluid. For a very brittle object 1% solution may first be used, followed after a few hours by 2–3% solution. While in the potash the object should be carefully watched, and should be removed when it threatens to fall in pieces. A certain amount of local disintegration, however, is to be expected, corresponding to places which had begun to decay before the drying process was completed. Those soft places, when the tissue becomes lost in potash, often appear in the dried condition as darker areas; for example, the left cheek of the woman mummy which dissolved under treatment and left the malar bone exposed (compare pl. II, 1, 2). The time in which an object should remain in potash varies, but may be given as between 12 and 48

hours, and it is well to remember that the caution which one naturally feels when treating a rare and valuable object impels one to remove it too soon rather than to leave it too long. In the former cases the features do not acquire their full size, and, in the latter, essential parts are in danger of becoming lost.

2. Upon removal from the potash solution the specimen should be placed in water for some time. This fluid appears to have a tendency to still further increase the swelling, but as it also hastens the maceration of the soft parts, it should be used with caution.

3. All expansion and maceration may be checked, and the parts left permanently in a given condition, by placing the specimen in a three percent solution of formalin, in which it is to remain indefinitely for permanent preservation. Since no further change can subsequently be produced in material once fixed and hardened in formalin, care must be taken that the desired increase in bulk be obtained before immersion in it.

4. If, as usually happens, certain parts are not sufficiently softened and enlarged at a time when the rest threatens to become too soft, the object may be removed from the potash and covered with absorbent cotton, which may be soaked locally in the fluid demanded. Thus the soft parts may be covered with cotton soaked in water, or even formalin, while harder portions may be still subjected to the action of the potash, applied in the same way. In addition to this method, potash may be applied to a refractory part by means of injection with an hypodermic needle. Occasionally glycerin or a mixture of glycerin and potash applied in the same way may be found of value.

III. — REPORT OF EXPERIMENTS

I. RIGHT THUMB OF A PERUVIAN MUMMY. (PEABODY MUSEUM.)

This was the first human material experimented on, and had been torn from a hand in such a way as to include the metacarpal, but was broken in two pieces at the metacarpo-phalangeal articulation. There was but little integument remaining, and the bones were completely bare over extensive areas, but upon the metacarpal there still hung a piece of the web between thumb and index, and

from the proximal end of the specimen there protruded several dried cords which eventually proved to be the tendons of the several extensor muscles of the thumb (*ext. primi internod. poll.* and *ext. secund. internod. poll.*).

After the treatment the portions of integument still intact were of about the usual thickness and were otherwise quite as when fresh; the portion covering the dorsum of the basal phalanx showed the characteristic pits for the hair, and the inner portion, especially upon the web, showed the epidermic ridges of the palmar surface. Unfortunately the integument covering the ball of the thumb had been entirely wanting in the dried specimen, so that there was no opportunity to study the apical pattern ("thumb-mark").

Aside from these normal appearances there were seen, scattered irregularly over the surface of the skin, a large number of minute whitish granules which correspond to nothing in the normal integument. A small portion of the integument, including some of these, was then imbedded in paraffin, sectioned with the microtome and stained in the usual ways (carmine, hæmatoxylin, various anilines), and the sections, when examined under the microscope, showed the granules to be minute bacterial foci, surrounded by walls of connective tissue, and were thus plainly pathological and referable to some skin disease, probably the illness to which the subject had succumbed. In the fresh state these granules had evidently been level with the outer surface of the skin, but owing either to decay or to weathering the epidermis had disappeared, leaving these foci projecting above the cutis by about the usual thickness of the missing layer.¹ Aside from these objects the sections showed clearly that the only tissue remaining was the connective tissue, but, since this forms a mold for every other tissue, the outlines of the various structures were well preserved. The blood-vessels were especially clear; the muscle fibers were marked by the sarcolemma, but showed no striations; the cutaneous nerves were clearly seen, but in cross-section they showed merely the network formed by the neurilemma of each fiber, and lacked both the medullary sheath and the axis cylinder. Beneath the cutis were seen the outlines of fat cells in masses, but

¹ The slides containing sections of the foci have been sent to the Army Medical Museum for examination, but no report has been furnished as yet.

as these were not quite spherical but somewhat flattened from without inward, it suggested that the restoration had not been complete, and that in life the soft parts were a little fuller than in the specimen at present.

While searching for material for microscopic study, one or two minute pieces of a brownish substance were found, apparently within the tissues. These appeared under the microscope to be bits of cork or bast, from the inner bark of some tree, thus suggesting the use of bark for its tannin during the process of embalming; however, the pieces were too uncertain in location to enable one to draw a safe conclusion, and may well have been adventitious.

2. TWO INFANT HEADS FROM THE CLIFF-DWELLINGS OF SOUTHERN UTAH. (AMER. MUS. NAT. HIST.)

These heads were of infants of the same age, that of about a year. They had the same general color and appearance and had evidently been merely sun-dried in the rarified mountain air, as was the case with all the Cliff-dweller material experimented with.

The soft parts had been preserved in certain regions only, while in others the bones were entirely bare. The best preserved one, designated in my notes as A, showed a nearly flat surface of dried skin over the entire face, featureless, save for the indications of eyes and eye-sockets (pl. 1, 1). No nose was visible, the part in the photograph which resembles that organ being the edge of the upper lip. The lower jaw was without flesh. Upon the side of the face were a few easily removable bits of skin bearing hair, which was that of some animal, as seen under the microscope, and were evidently the remains of a skin in which the body had once been wrapped.

After treatment, Head A presented the appearance shown in plate 1 (2, 3). The nose, of which no trace could be seen in the dried specimen, was well restored, and this, as well as the upper lip, exhibited the characteristic infantile type. The cheeks showed a large amount of yellowish-white fat, and the skin, especially about the forehead, appeared perforated with wormholes. In color the skin was a light yellowish-brown, with frequent localized discolorations, and, although it would be hardly safe to maintain that this



HEAD OF CLIFF-DWELLER INFANT, SHOWING EFFECT OF TREATMENT
1, In dried condition. 2 and 3, The same after restoration. (Photographed from the object.)

method of restoration has the power of restoring the original color, yet the rich brown color of the Peruvian specimens (1 and 4), the light yellowish-brown of the infants, and the brownish-red of the adult "Basket people" seem to approximate in each case one's idea of the original color. One eyelid in this specimen was well brought out and showed well-marked Meibomian glands upon its inner surface. When sectioned, the molds of these glands were definitely shown in the connective tissue, which outlined each lobule, but as in the other cases noted, all epithelial tissue had been lost.

Head B proved of little interest except that the scalp was covered with the crust often seen in neglected infants, "scald-head" (eczema). This specimen, when in the dried state, had shown curious excrescences upon either cheek which may have been of pathological significance, but yielded no especial results after restoration. Microscopic sections taken in various directions showed them merely as rather porous masses without special structure. They may, indeed, have been nothing more than the fat of the cheeks pressed upward by bandaging, but they did not show a trace of the actual fat so abundant in Head A.

3. BODY OF ONE OF THE ABOVE INFANTS

This little specimen was very much flattened, being hardly more than a centimeter thick in any place. It had evidently lain upon its back and right side, as these regions had lost the soft parts, apparently through decay, so that the bones were completely exposed. The most interesting point in this specimen was that, when subjected to the usual treatment, much of it dissolved into a soft, almost jelly-like substance of a dark-brown color, indicative of the advanced state of decay into which these parts had fallen before the drying process had been completed.

The same result has since been seen locally in other sun-dried remains, and such places are indicated in dry specimens by a dark-brown color. In this case the only parts rescued from this destruction were the skin of the abdomen, which had evidently remained uppermost, and the legs (the arms had been lost). These latter came out very well, although the fat, which had once been very abundant, was less amenable to treatment than other tissues, and

retained in a measure the creases and other forms which it had assumed when drying. The feet were very successfully restored, and it was noticeable that the four lesser toes were of approximately the same size.

Accompanying this body was a large piece of animal skin covered with hair similar to that upon the fragment found on the face of Head A. This, when restored, did not come out to the full thickness and consistency of fresh integument, but remained thinner and firmer, and had evidently been subjected to some tanning process.

4. HEAD OF YOUNG ADULT PERUVIAN. (AMER. MUS. NAT. HIST.)

This experiment was of value in showing the deficiencies of the Peruvian method of embalming and the inferiority of such a process to the natural one to which the various sun-dried remains studied had been exposed. The specimen was the head of a young man, evidently between eighteen and twenty years of age, and probably of high rank, as shown by the gold beads about his neck and by the extreme care with which his body had been embalmed. The mouth cavity was well-filled with cotton from which the seed had been for the most part removed; his neck was wound around with several layers of cotton cloth, the inner strip of which was tied in a simple knot, and there seemed to be a large circular patch of some red pigment upon either cheek. His very abundant hair was wavy and flowing, and originally came about to his shoulders. The nose and the ears were present, although flattened and dried, and the skin of the face showed no dark patches indicative of decay, although the surface was cracked in several places, a circumstance which produced much difficulty in the attempt at restoration. In short, the general appearance was so good and the features so complete that we entertained great hope of a very satisfactory restoration.

In beginning the treatment, the hair was first carefully removed with shears, and the head immersed for a few minutes in water until the surface was well moistened, after which it was placed in a weak solution of caustic potash, not over 1 percent. Within a few minutes after immersion in the potash, the failure of this case became apparent. The two edges of the skin bordering each of the numerous cracks curled outward and revealed rapidly increasing areas of

bare bone, and patches of skin cut off from the rest by cracks separated completely and floated away. It became evident that the embalmer's art had but arrested decay upon the surface alone and that nearly everywhere all structures between the integument and the surface of the bone, including the periosteum, had long since completely disappeared. The total absence of the ligaments was seen by the spontaneous separation of the cervical vertebræ from one another, and, as the process continued, the lower jaw, when free from its confining integument, became also separated from the skull, not a trace of ligament remaining to fasten it to the head. When the process was complete, the skull had lost neck, jaw, and the integument of the entire face as far up as the eyes, including the ears laterally, that of the eyebrows, forehead and scalp alone remaining, an area which corresponds to the region over which the integument lies directly upon the bone, and had probably dried without decay of the subcutaneous parts.

Noticeable features brought out by the treatment were (1) a raised scar extending along the right eyebrow, corresponding approximately to the superciliary ridge of the frontal bone, and (2) a small round bluish spot about 7 mm. in diameter, situated in the middle line of the forehead and possibly a tattoo mark.

Although disappointing from the standpoint of results, this experiment was extremely useful as a test of the Peruvian embalming process (or at least that used in this particular case) and in showing what we may expect in the case of this class of remains. If, as in this case, all ligaments and the soft parts intervening between the skin and the bone have disappeared, we can hope for little in the way of restoration except that of the integumental surface itself, or of the contour in case of regions where the soft parts readily admit of drying, as in the case of hands and feet. In the preparation of integumental surfaces for the better study of such points as tattoo-marks, scars, and skin diseases, the method may have a practical application even here.

5. ADULT MUMMIES OF THE "BASKET PEOPLE." (AMER. MUS. NAT. HIST.)

These consist of two adults, a man and a woman, the man without a head. They were obtained from a cave in southeastern Utah

by the Hyde Expedition, and are referred by Professor Putnam to the "Basket-people, who seem to have occupied these caves earlier than the cliff-house people," but are considered by Dr Hrdlička to be identical with the latter, *i. e.*, "the prehistoric southern Utah Cliff-dwellers."¹ They had been evidently sun-dried, or, at least, air-dried under conditions that did not favor decay, probably those of a high mountain altitude, and had neither been embalmed in any way nor had the most ordinary care been taken of the bodies, and they had dried in apparently the positions assumed at death. The man lay on his back, with his knees strongly flexed and turned toward the right side, suggesting that they had been drawn up at death and had fallen to one side during the softening process of incipient decay. The woman was in a half-sitting posture, with knees semi-flexed, but at different angles, and with the toes drawn back by an extreme tension of the extensors. In both the position in which they had lain relative to the surface of the earth was very apparent, as those surfaces which had lain uppermost were very hard and white and showed no decay, while the lower surfaces were darker in color and had decayed sufficiently in some places to expose the bones. Thus in the man the dorsal surface of the sacrum was entirely bare and the coccyx readily removable. Aside from these lower surfaces there were a few places that exhibited the dark-brown color suggestive of decay, and in some other localities, *e. g.*, along the arms of the woman, the soft parts had suffered somewhat from the ravages of worms or from mechanical injury, thus exposing the bones.

Description fails, however, to give an adequate idea of the lightness and dryness of these remains. Although no tests were applied, the specific gravity must have been considerably less than that of cork, and in defective places, as along the arms of the woman, the parts splintered and crumbled almost at touch. The man had evidently been tall and large during life, but in his present condition he could be carried with ease by one hand at arm's length, and could not have weighed more than 12-15 pounds. Pieces of skin that cracked off in places, and which, when restored, had a thickness of 5-7 mm., measured about 1 mm. on an average and were hardly

¹ Quoted from personal letters from the authorities named.

distinguishable from pieces of the inner bark of trees. When placed in water, an arm or a leg would lie upon the surface, repelling the liquid, and it was with some difficulty that they could be at first forced beneath the surface.

For the treatment of these mummies I had two tanks constructed of galvanized iron, and supplied with flowing water by means of iron piping and siphons of rubber tubing. These tanks had a depth of 20 cm. and a width of 45.5 cm., and one of these was 76 cm. and the other 59 cm. in length. In conducting the experiments, which occupied the greater part of the winter, the mummies were dismembered in accordance with convenience, and the parts successively subjected to treatment, beginning with those parts which were of lesser value. As the details of this series of experiments would prove too laborious to record, and certainly too tedious to read, the matter may be considered under the three general topics of (*a*) the limbs, (*b*) the trunks, including the internal organs, and (*c*) the head and bust of the woman.

(*a*) *The limbs.* — Perhaps the most instructive observation obtained from these was that the muscles, when not decayed, showed a greater tendency to swell than did the integument, and that the extreme and long-continued drying to which this latter had been subjected through several centuries, prevented its expansion to quite its original condition. This was, of course, less noticeable over such parts as the feet or the dorsum of the hands where the bones lay in a superficial position; but upon such a place as the fleshy ventral side of the forearm, where the muscles would naturally round out the part and present a convex surface, the hampering effect of the tight integument was easily apparent. Especially in places where the integument was cut through, or along the edge of the limbs, where they had been severed from the body, could this effect be seen, as in such places the muscles were allowed to escape from their confines and swelled out to what was probably their original size. Such muscles were of an amber color and far more transparent than when fresh, yet consisted of bundles of fibers, which showed the characteristic appearance under the microscope, although lacking all trace of striation.

Portions of large girth, with a large proportion of soft parts,

like the thighs, did not produce good results. In most cases these parts showed enough decay to prevent complete restoration, and even when this was not especially apparent, there was not sufficient rigidity in the soft parts to fill up the contours suggested by the skin. The limbs from knee or elbow down, were, for the greater part, well restored, although in such places as fore-arm, calf, or the thenar and hypothenar eminences of the hand, the integument was usually too rigid to admit of full expansion. The epidermic ridges of the surface of the palms and soles were very evident and we were able to trace out the complete patterns, although, as a matter of fact, the entire epidermis must have been wanting and what we really saw was the mold or cast of these ridges upon the surface of the cutis.

The best general results obtained were those of the right arm and hand, the left leg and foot of the woman, and the right foot of the man. From these it could be seen that both hands and feet were extremely narrow and the arch of the latter very high. The woman had been evidently of middle size, and had borne children (see below), but her foot was of about the size of that of a little girl of seven or eight of our race, although narrower than is usual with us.

These deductions cannot in this case be due to a deficiency in the swelling out of the tissues, since the proportions depend mainly upon the bones and very little upon soft parts other than the integument the normal thickness of which had evidently been regained. On restoring the woman's left hand it was found that the thumb, which was pushed between the index and middle fingers, held between it and the first joint of the latter a flat and rather soft object, the nature of which could not be made out, but which seemed of vegetable origin. Whether this object has any bearing upon the customs of these people I cannot say, but the entire hand was clenched and the object appeared as if intentionally though awkwardly held.

(b) *The trunks, including the internal organs.* — These were treated in the larger tank after the separation of the limbs, and were not as satisfactory regarding reestablishment of the original contour as were the other parts, but furnished very interesting studies of the internal parts. In all cases the integument with its character-

istic markings becomes quite normal of appearance and in a few points deserves some little notice.

The entire back of the woman, when treated, was marked with a conspicuous cross-striping which extended from the neck to sacrum and from side to side. This consists of bands of smooth dark skin of about 5 mm. in width and placed parallel to one another at regular intervals, leaving interspaces of perhaps 7 mm. At first we thought of a tattoo, but its extreme regularity as well as its location suggested the former presence of something woven upon which she had originally lain, probably a mat, the cross-weaves of which had protected the surfaces with which they had come in contact, allowing the erosion to continue between them. Microscopic examination corroborates this conclusion, since the stripes give evidence of a far better preserved condition of the cutis than is shown by the more spongy interspaces.

As for tattooing, certain dark stripes upon the man, one placed lengthwise on one shoulder, another in the midline of the abdomen from umbilicus to pubis, may possibly be referred to this head, but a far more obvious example is that upon the other shoulder, which consists of a series of heavy black oblique lines ranging from 5-8 mm. in width, crossed by a second set of oblique lines in the opposite direction. If this be a tattoo, it is of very crude workmanship; the lines show no regularity in width, and are irregularly placed. Aside from the above, the forehead of the woman, before it was subjected to treatment, showed five or six lines in consecutive circles, the lines being themselves composed of separate oval dots, but the arrangement of the entire design was asymmetrical, the center being near the inner corner of the right eye. Since no trace of this was left after the treatment, it was probably a paint or marking left by some article of clothing.

Both trunks after brief immersion in the potash (one-half to one hour) admitted of a thorough and very satisfactory dissection; the organs were found for the most part well preserved, but dried to the consistency of thin membranes, incapable of further restoration, undoubtedly because the connective tissue elements alone were left. Thus the intestines, the mesenteries with their blood vessels, and even the omentum were easily distinguishable and were with some

care separated from one another, but the heart was reduced to a shrunken mass of membrane representing the pericardium, the valves, etc., and all that could be found of the liver were the numerous branches of the blood-vessels and bile ducts, the latter observation especially emphasizing the fact of the loss of all epithelial tissues. In the stomach both muscular and serous coats were well preserved, and separated from each other almost spontaneously ; but in both cases the stomach, although normally inflated, was either completely or almost empty, that of the woman yielding three melon seeds and a single piece of some stringy substance which we have been unable to identify. Several masses of fecal matter were found in the intestines of the woman, which, when examined with the microscope, yielded nothing but a few bits of vegetable tissue. In both cases the appendix was normal and well developed. The lungs, corresponding to their large connective tissue constituent, were well preserved, and in a few places had imprisoned a little air in drying. They showed both by their color and under the microscope carbonization to about the same degree as in the modern white race.

The kidneys were reduced to thin wafers, consisting evidently of the pressed and dried tubules of the medulla, and to these were attached the ureters, connected with well-preserved urinary bladders. The uterus of the woman was slightly asymmetrical, being deflected toward the left side, and as the distance between it and the left ovary was far less than between it and the right one, it is probable that this lateral displacement had been present during life, and was not due to the effect of gravitation acting upon the organ after death. The shape of the os uteri externum indicated that she had borne children, a supposition in accordance with the condition of the mammæ, which was shown by the integument, although the glandular portion, being epithelial, had long since disappeared. In the man the appearance of the genitals did not indicate circumcision, although the prepuce had become very thin and the free edge of the fold was ragged and worn.

(c) *The head and bust of the woman.* — As this piece presents the most general interest, both in itself and as a test of the method used, we took several photographs of it both before and after

treatment, the presentation of which (pl. 11) will almost obviate the necessity of further explanation. The separation from the body was made just below the arm-pits, in order to preserve the contour of the neck and shoulders and the relation of the head to the trunk. In the dried state the head was bent strongly to the left, as though it had fallen over by the force of gravity before it became stiffened by the process of desiccation, and it is interesting to note that this defect became in great measure remedied by the treatment through the natural elasticity of the parts, although no especial attempt was made to straighten it. The same may be observed in the case of the lower lip, which had fallen down and dried in that position and which came up of its own accord by the restoration. The dropping of the jaw, however, perhaps because dependent upon ligaments and other internal parts, was not completely remedied, although much improved, and the separation of the lips in the restored specimen is due to this rather than to any defect in the lips themselves (see especially fig. 3). The left eyelid came well into shape and remains closed, while the right is partly open, and as the eyeball of this side was somewhat deficient, the socket was filled out with absorbent cotton, which is the white mass showing in the photograph. The left eyeball is quite full, although somewhat wrinkled, and shows a good iris and pupil when the lid is raised. The cartilaginous portion of the nose is, unfortunately, not wholly restored, since, when the head had attained its present condition, some of the softer parts threatened to fall to pieces, and in order to prevent this the entire head was put in three-percent formalin over night. This hardened the entire specimen and rendered the skin so firm and immovable that all subsequent treatment was of no avail. The method of continuing the action of the potash over certain areas alone, as suggested above, occurred to us too late, and although we worked for several days over the nose, there was little if any later improvement. I am persuaded, however, that if the formalin had not been used at that time, and if the potash had still been applied to the nose while the other parts were wrapped in wet cotton as recommended above, the result would have been better; but a comparison of the photographs of the dried and of the restored face will show a great improvement in the feature under dis-

cussion, even though it has failed to attain its original proportions. The elasticity shown in the lips and neck appears also in the case of the ears, as a comparison of the two sets of photographs will show.

Upon the right side of the head, above the ear, is a rather extensive oblong area from which the scalp had been removed, showing the bone (pl. II, 3, 5). As this was the condition in the dried specimen, although hardly distinguishable owing to the uniform color of this and the rest (pl. II, 4), it suggests that this piece had been removed before the body had dried, but for what purpose we can only conjecture. In pl. II, 4, 5, there will also be observed a curious scar at about the top of the head, which consists of a deep indentation of the bone lined by the skin and is undoubtedly the result of an injury received earlier in life.

Except in the most sheltered portion of the back of the neck there was no trace of hair, and this, taken in conjunction with a few other observations, gives a singular conclusion. In the first place the absence of hair is correlated with the total absence of nails from both fingers and toes, although the nail beds are so perfect that this absence is scarcely noticeable. Then, in draining off the tanks after the operation, there was left a considerable quantity of a brick-red deposit, which dried into a coarse powder and showed itself under the microscope to be dune sand, little irregular nodules of reddish quartz, which, although not noticeable in the dried specimens, must have filtered into every crevice and have become dislodged by the washing and soaking. This dune sand may perhaps furnish the clue to the absence of nails and hair, and suggests that they have been worn off by the tritulating effect of the wind-blown sand.

Another phenomenon, and one which is less easy to explain, has been the discovery of countless specimens of a small species of mite (*Acarina*), first found upon the stomach-contents of the woman, and later, in still greater quantity, within the uterus and in the nasal cavities. In the latter places, small reddish particles, which detached themselves from the walls, resolved themselves into masses of mites, some entire and others in fragments, mixed with blood corpuscles. Here the simplest supposition is that, being troglodytic animals, they have used the dried mummies for their habitat in the same



HEAD OF WOMAN MUMMY OF THE "BASKET PEOPLE" (CLIFF-DWELLERS)
1 and 4. In dried condition. 2, 3, and 5. After restoration. (Photographed from the object.)

way as they would use a fallen tree-trunk, and that they have found their way to all accessible cavities of the body, although their association with blood corpuscles might indicate either a parasitic habit, or that they infested the body soon after death.

Much can certainly be obtained from further microscopic investigation of softened mummied material, but not only is a thorough knowledge of botany, zoölogy, anatomy, and histology necessary, but an acquaintance with the ethnology of the people to be studied, including their manners, customs, and religious rites, in order to intelligently direct such investigations. This work can best be done then by the collaboration of several investigators, and it may be hoped that something will be done in this line in the near future.

As far, also, as the gross application of the softening and restoring method is concerned, my investigations thus far have not covered the field or exhausted the possibilities of the method, since the various forms of Egyptian mummies have not yet been tested, nor has the investigation of the Peruvians been by any means completed. It may not be too much to suggest, if the method is found applicable to the best embalmed mummies of the Egyptians, that at some future time the faces of the great Pharoahs may be seen in a still more life-like condition than that which they exhibit at present in the glass cases of the Gizeh Museum.

GLOSSARY OF THE MOHEGAN-PEQUOT LANGUAGE

BY J. DYNELEY PRINCE AND FRANK G. SPECK

There is always something strangely pathetic about a dying language, especially when, like the Mohegan-Pequot idiom, the dialect exists in the memory of but a single living person. Mr Speck has obtained two connected texts and most of the following words and forms from Mrs Fidelia A. H. Fielding, an aged Indian woman resident at Mohegan, near Norwich, Conn., who has kept up her scanty knowledge of her early speech chiefly by talking to herself. The text of a sermon in Mrs Fielding's dialect has already been published by us with full philological commentary in the *American Anthropologist* (vol. 5, pp. 193-212). Another shorter text with a similar commentary will soon be published separately by Mr Speck alone.

The following word-list of 446 words and forms were all collected by Mr Speck during the last year at Mohegan, Conn., chiefly from Mrs Fielding, and submitted to Professor Prince in Mrs Fielding's spelling. In arranging these words into a glossary, all the work of which was done by Professor Prince, it has been thought best for sentimental reasons to adhere to Mrs Fielding's orthography, imperfect as it is. Her system is undoubtedly that of the few white men and educated Indians who tried to write the Pequot language while it was still a living idiom. The proper pronunciation of each Pequot word as uttered by Mrs Fielding is given in parentheses, in accordance with the following method: Of the vowels, $\bar{a} = a$ in "father"; $\hat{a} = aw$ in "awful"; $\bar{e} = ay$ in "may"; $\check{e} = e$ in "met"; $\hat{i} = i$ in "machine"; $\check{i} = i$ in "pin"; $\bar{o} = o$ in "note"; $\check{o} = o$ in "not"; $\hat{u} = u$ in "rule"; $\check{u} = u$ in "but"; $\ddot{u} = oo$ in "foot." The apostrophe (') = a short indeterminate \check{u} -vowel. The consonants have the English values, except that g is always hard as in "go"; final $-kw = kw\check{u}$, with a very short final vowel; $\bar{n} =$ nasal n as in French final n ; $\check{s} = sh$. The combination ts^y is to

be pronounced with a slight palatalization after the sibilant. The inverted comma (‘) indicates a light rough breathing similar to the Arabic medial *He*.

Throughout the glossary an attempt has been made to give, so far as possible, the cognates of each Pequot word. Here it should be noted that in Abenaki *ô* = *on* with nasal *n*, as in French *mon*, and *ö* = German *ö*. In Delaware the German system of phonetics followed by Brinton in his *Lenâpe Dictionary* has been observed. The Natick and Narragansett words are given according to the English system followed by Eliot and Roger Williams,¹ while the Ojibwe words are to be pronounced with the Italian vowels as given in Baraga's *Otchipwe Dictionary*.

Although Mrs Fielding's dialect of Pequot is in the last stages of decay, as has already been pointed out,² it still retains enough of the original phonetics and grammatical phenomena to enable us to judge very satisfactorily regarding the primitive character of the language.

In the Pequot phonetics we note that the Peq. *b* generally = N. *p*, and that the Peq. has an indeterminate consonant *ḅ* between *b* and *w*.³ This is probably the sound which Eliot indicated by *ff*. Furthermore Peq. *d* = N. *t*, Peq. *g* = N. *k*, and Peq. *z* = N. *s*, thus showing the marked tendency of the Pequot to medialization. Perhaps the most striking characteristic of Mrs Fielding's Pequot is the extraordinary elision of the original *l* = *r* = *n*. Thus, we find *moish* hen = N. *monish*; *ikekuzoo* 'he works' shows the same stem as the Abn. *aloka*; *weyungoo* = Abn. *ulôgua* yesterday = N. *wummunkw*;

¹ The Natick *u* represented in Eliot's writings by the horizontal figure 8 (∞) I have indicated simply by *u*.

² *American Anthropologist*, 1903, vol. 5, p. 210.

³ The following abbreviations are used: Abn. = Abenaki; C. = Josiah Cotton, Vocabulary of the Massachusetts (or Natick) Indian Language, *Mass. Hist. Soc. Coll.*, ser. 3, II, 1830; D. = Delaware; LD. = *Lenâpe Dictionary*, by D. G. Brinton; N. = Natick or Massachusetts; ND. = *Natick Dictionary*, by James Hammond Trumbull, 1903; Oj. = Ojibwe; RW. = Roger Williams, *Key into the Language of America*; Stiles = Ezra Stiles, *A Vocabulary of the Pequot Language obtained by President Stiles in 1792* (copy in the library of the Bureau of American Ethnology). The signification of the other abbreviations used is obvious. The Abenaki and Passamaquoddy material used in this article comes from Professor Prince's collections. The Natick words are from Trumbull's ND., the Narragansett from RW., the Delaware from Brinton's LD., and the Ojibwe from Baraga's *Otchipwe Dictionary*.

zoogeryon rain = Abn. *soglon* = N. *sokenum*, etc. This inability on the part of the Pequots to pronounce an *l-r* sound is even seen in their English loanwords. Thus, *beyoti* plate; *beyungut* blanket; *beyoum* broom. There is no *r*-sound in Peq., in spite of Mrs Fielding's repeated use of this consonant in her text as a mere stop consonant (see *Am. Anthropol.* v, 199). A most curious point in this dialect is the dual pronunciation of some words with either *j* or hard *g*. Thus, *chawgwan* or *goggwan* what; *googernos* or *goojernos*. This perhaps points to a blending in Mrs Fielding's idiom of two distinct Algonquian linguistic variations, i. e., one which used the *j*-sound as in Abenaki and Ojibwe, and one which regularly used the hard *g* as in Peq. *woggey* for, in order that, = Abn. *waji*.

This theory that two Algonquian dialects existed in the Mohegan community seems to be further confirmed by the fact that Mr Speck has obtained two slightly varying systems of numerals, the one from Mrs Fielding and the other from an old Mohegan Indian, James H. Rogers. The following comparison of these two systems with the Natick and Narragansett numerals will serve to illustrate this point:

	MRS FIELDING.	ROGERS.	NARRAGANSETT.	NATICK.
one	<i>neqút</i>	<i>ník't</i>	<i>nquit</i>	<i>nequt</i>
two	<i>nís</i>	<i>nís</i>	<i>neesse</i>	<i>neesse</i>
three	<i>ch'wí</i>	<i>ch'wí</i>	<i>nish</i>	<i>nish</i>
four	<i>iâw</i>	<i>iâw</i>	<i>yoh</i>	<i>yaw</i>
five	<i>nîpâu</i>	<i>nîpâ</i>	<i>nepanna</i>	<i>napanna</i>
six	<i>k' dũsk</i>	<i>nî' kũdũs</i>	<i>qutta</i>	<i>nequttatash</i>
seven	<i>nîzũ'sh</i>	<i>nî' zũ'sh</i>	<i>enada</i>	<i>nesausuk</i>
eight	<i>ch'wí-õ'sk</i>	<i>ch' hõns</i>	<i>shwosuck</i>	<i>shawosuk</i>
nine	<i>bõzũkũ'kwõng</i>	<i>bõzũkũ'gõn</i>	<i>paskugit</i>	<i>paskoogun</i>
ten	<i>bâ'iõg</i>	<i>bâ'iõg</i>	<i>piuck</i>	<i>puik</i>

It should be noted in this connection that the Peq. *s* tends to become *š* in juxtaposition with another consonant. Thus, *squaaw* = *škwâ* woman, and *skeesucks* = *škîzũks* eyes. Two noteworthy cases of metathesis are seen in Peq. *geyommon* spoon = Abn. *amkuôn*, and Peq. *skeeshu* quick = Oj. *kejidin*.

The original grammatical phenomena are poorly preserved in Mrs Fielding's idiom. Thus we find the inan. indef. form *neweek-*

tumun explained by her as meaning 'I love him.' This can only mean 'I love *it*.' In another instance (see WEESHAWGUNSH) she uses the inan. pl. ending *-sh* where the an. pl. *-ug* should have been employed. Furthermore, her moods have nearly all disappeared (Cf. *yunjumum* 'that he open,' not a subjunctive at all), but note *wombunseyon* 'if I live in the morning,' a genuine conditional. Other correct forms, however, have been rescued from the wreck. Thus, *newotinemong* he helps me (*Am. Anth.*, v, 204); *newotinemo* I help him, etc. In *quonwehige* 'it scares me,' the *n* of the 1st p. has been lost, i. e., *nequonwehige* is the correct form. The preservation of the phonetic infix *-t-* is also noticeable, as in *gertub*, q. v., and the imperative suffix *-ush* is still extant. See s. v. BEUSH.

In vocabulary the Pequot is very close to the Natick and Narragansett, as will be seen from the glossary. It is probable that Naticks, Narragansetts, and Pequots were mutually intelligible without much difficulty. On the other hand, a few Pequot words are traceable only to the Abenaki, and occasionally only an Ojibwe cognate is possible. A very few words are given in the glossary as being without discernible cognates.

Words indicated as Brothertown words were collected by Mr Speck from an old Indian at Mohegan who had lived for some time at Brothertown, near Green Bay, Wisconsin, whither a number of New England Indians, notably Tunxis, Wampanoags, Mohegans, and a few Long Island Montauks emigrated about fifty years ago. As will appear below, these words are merely corruptions of Ojibwe forms.

Our Mohegan-Pequot list should prove a useful supplement to the late James Hammond Trumbull's *Natick Dictionary*, to which constant reference has herein been made. In spite of the doubtful character of much of Trumbull's work, his dictionary is valuable as a list. Mr Speck has rescued from oblivion the remains of what was once the speech of a powerful New England nation, a speech which according to all previous accounts had perished at least sixty years ago! Mrs Fielding is indeed the Dorothy Pen-treath of the Mohegan-Pequots, and is quite as deserving of an enduring monument as was the last old woman who spoke Cornish.

MOHEGAN-PEQUOT GLOSSARY

AHUPANUN come here. Brothertown word. No cognate.

APPECE apple (*äpi's*). There is no native equivalent for 'apple' in Abn. (*aples*) or D. (*apel*). The word is not given in ND.

AQUE hello (*ëkwi'*) = Abn. *kuai*.

BAGENOOD bag (*bā'gēnûd*). A hybrid, the last part of which is cogn. with RW. *nutassen* hemp-bags; cf. N. *nutin* to lift up; RW. *niutash* to take on the back. Same stem as in *manodah* bag, q. v.

BAHDUNTAH rising, said of the sun *geezushg*, q. v. (*bā'düntā*). Cogn. with N. *nepattuhquonk* a stake, pole, from *nepadtau* stand.

BAHKEDER maybe, perhaps (*bākidü'*). This is past. The fut. is *bāki-mü's*. Cf. N. *paguodche* (fut.). Element *pa* = *bah*? The separate form is *bahke*.

BATSHA it is come (*bā'chā*) = *pa* + *cha*, *pa* being the indefinite particle 'it is continuing.' Cf. N. *pakodjiteau* it is finished (ND. 259).

BEEBEE evil spirit (*bîbî*)?

BEED bed (*bîd*). Eng. loanword.

BEEDDUNK bedstead (*bîdunk*) = *beed* + the loc. ending.

BEESH peas (*bîs*). Eng. loanword; cf. Abn. *piz*.

BEETKUZ lady's dress (*bî'tkô'z*) = Abn. *pitkôzon* coat.

BEITAR Friday (*bîâ'itâ*). Here we certainly expect the *b* which is not present.

BEKEDUM give up (*biki'düm*). Cogn. with Abn. *nd-abagidam* I void excrement, renounce; D. *pakitatamaüwan* to forgive someone, LD. 106 (see *Am. Anth.* v, 207).

BEKSEES pig (*bî'ksîs*). Eng. loanword with dim. *-sîs*; cf. Abn. *piks*, showing the *s* of the Eng. plural.

BEMUNT thread (*bî'münt*) = N. *pemunneoh*t cord, string.

BEOWHY flour (*bîâ'üwî*)?

BERCUD smoke (*bākū'd*) = N. *pukut*; RW. *puck*; Abn. *pekeda* smoke.

BEUSH come, with imv. *-sh* (*bî'üş*) from *√bî* come = N. *peyâu*, Abn. *paiô* (see *Am. Anth.* v, 205). In Pequot we find also *mūs nē-bîyo* I shall come. See MUS and BEYOR.

BEYOR he is coming (*bîgō*). See BEUSH.

BEYOSHERMEED meat (*bîyâ'sāmîd*). A hybrid, from *bîyâ's*, a variant of *wecous* meat, q. v. + Eng. meat. Note here the medial *b*.

BEYOTI plate (*bîyô'ti*). Eng. loanword. Note the change of *l* to *y*.

BEYOUM broom (*bîyû'm*). Eng. loanword with softened *r*.

BEYUNGUT blanket (*bîyû'ngût*). Eng. loanword. Cf. the Narr. *pinâ-quet*, also a loanword.

BIOG ten (*bâ'ïög*). Stiles *piugg*; N. *piuk*, *piog*; Long Island *payac*, *paunk*. This is a genuine New England numeral. Abn. has *mdala* and Pass. *mtuln* ten.

BODDERNASHAH flying (adj. (*bōdünā'sā*). Cogn. with N. *ptūeu* it flies and with *du* in Abn. *pami-duo* he flies.

BOIGE porridge (*bōij*) = N. *sebaheg*, pottage. See WEOUSIBOIGE.

BOMKUGEDOH all the world (*bō'mkūgī'dā*). *Bom* = *wom* with *b*; *kūgī* must be a reduplication of *kī* earth. See *Am. Anth.*, v, 206, 11.

BOOKQUE dirt blowing (*bū'k-kwē*). Lit. 'it blows'; N. *putau* he blows, ND. 227.

BOOKSHA break, lit. he b. (*bū'kšā*). Abn. *poskwenōmuk* one b.; RW. *pokesha*. I connect this with Abn. *pask-ha* shoot.

BOPOOSE cat (*bōpūs*). No cognate.

BOPUQUATEES little quail (*bōpū'kwāti's*). Stiles *papoquateece* partridge; N. *pahpahkshaas*, *pohpohkussu*; RW. *paupook*.

BORWESA pretty well (*bā'wī'sā'*) with a variant form *pā'wī'sī'*. This must be a derivative from the N. stem *peawe* little, seen also in Abn. *piūsessit* he is little.

BORZUGWON one thing, from *borzug* one (*bā'zūgwū'n*) = N. *pasuk*, *psauka*; Abn. *pazegwon*.

BOSHKKEAG gun (*bō'ski'g*) = RW. *peskunch*; Abn. *paskhigan*; Cree *paskesiggun*. See BUSHKWA.

BOSU good-day (*bā'ūsū'*). Plainly a deriv. from Fr. *bonjour*. Brothertown word.

BOYZUG one (*bōizū'g*); see above *borzugwon*. Cogn. with Abn. *pazegwon*; Old Alg. *pezekw*; RW. *pawsuok*; Oj. *paizhik*; Cree *peyak*. Mrs F. wrote the form *boyzug* in the sermon, perhaps by accident, but it may be an old form seen in Cree *peyak*?

BOZUKUKWONG nine (*bōzūkū'kwōng*) also *bōzūkū'gōn*; cf. N. *pakugun*.

BUMBIGE a splint which binds a basket (*bōmbā'ig*)?

BUMSHORK they walk (*būmšā'k*) = *pomushauk*; Abn. *nb'mosa* I walk, etc.

BUNGASOO lame (*bū'ngāsū'*). This may be cogn. with N. and RW. *qunnukwesu* he is lame; cf. Abn. *ngwetsidaiwi* lamely.

BUNNEDWONG knife (*būni'dwōng*) = RW. *punnētunck*; Stiles *punnee-dunk*.

BUNNEED bonnet (*bū'ni'd*). Eng. loanword.

NE BUSHKOZETEORSUN I fall down (*nī būškōñzitiā'sūn*). Also Niantic acc. to Mrs F. Cf. N. *penushau*, *petshaog* they fall.

BUSHKWA he shoots (*bōšk'wā*) = Abn. *paskhomuk* to shoot. See BOSHKKEAG.

BUSHKWA noon (*bû'skwâ'*) = N. *puhshequeaen*; RW. *paushaquaw*; Abn. *paskua*.

B'WACHU small (*bôwâ'chû*) = N. *pechean* he makes small; Abn. *piûsessit* he is small.

BWEZE pot, chamberpot (*bûwî'z*) = N. *wiskq* a vessel, dish.

BROWHY good-bye (*bâ'îôwâ'i*); plainly an Eng. loanword from 'bye-bye.'

CANAKISHEUN where are you going? (*Kânâki'shëün.*) Brothertown word. From Oj. *aka* where, *ija* go.

CANUKEY private parts (*kânû'ki*) must be from the same stem as N. *kinukkinum* he mixes; cf. N. *kenugke* among.

CHAWGWAN what, something (*châ'gwôn*). Cogn. with Abn. *kagui*; Pass. *kekîw*; N. *chagwas*. *Chawgwan* is pronounced also *gâ'gwân* with hard g. See *Am. Anth.*, V, 205. For its use, cf. *chawgwan ne* what is that; *womme chawgwansh* all things.

CHAWHOG where (*châ'hög*). I can find no cognate for this. N. *uttiyeu*; Abn. *tondaka* where. In Pequot *chawhog gertish* = where are you going? See s. v. GERTISH. *Chawhog gerwoochi* = whence come you? *Chawhog* is often suffixed, as *gêtâwî tûbô' jôhög* where shall he stay?

CHAWSUN hard (*châ'sûn*). No cognate.

CHEEGUT weak-fish, Labrus Squeteage (*chî'güt*) = N. *checout*, *chequit*, from *chohki* spotted? (ND. 21).

CHEEHS cheese (*jîs*) with obscured s. Eng. loanword. Cf. Abn. *chîz*.

CHEEME always (*chî'mî*), abbrev. for *wucheme*, q. v. Cf. Abn. *majimiwi*; N. *micheme*.

CHEEPHUGGEY dreadful, terrible (*chîpû'ggî*) = D. *tschipinaquot* he is terrible. Same stem as in *tschipey* spirit (see JEEBI, and Prince in *Proc. Amer. Philos. Soc.*, XLI, 29).

CHEEWEE nearly, in *chewee bushkwa* nearly noon (*chî'-wî'*). Perhaps cogn. with Abn. *paso-jîwi* almost.

CHEEWHY new (*chî'whâi*). No cognate.

CHEWEE three (*chîwî*) = N. *nishwe*; RW. pl. inan. *shwinash*; Stiles *shweh*.

CHEWEE-OSK eight (*chîwî'-ô'sk*). Stiles *shwausk*; RW. *shwosuck*; N. *shwosuk*; Abn. *nsôzek*.

CHOV nose (*chôï*) = Stiles *wuchaun*; N. *mutchan*; Abn. *mejôl*.

CHUGGUNCE hay (*chû'gûns*). I think this must be the word for 'chicken' and an Eng. loanword. See KERCHUSH.

CHUNCHE must (*chũ'nchi*) = Abn. *achowi*. This is not in N., where *mos* = must (see MUS).

CHUNCERCHEE, see KUNCERCHEE.

NE CHUNTUM I want (*ně-chũntũm*) = N. *ahchewontam* he desires it.

NE CHUYER I need (*ně-chũ'yũ*); *chũwák* they need. See *Am. Anth.*, v, 203, and cf. CHUNTUM.

CIDI cider (*să'idă'i*). Eng. loanword; cf. Abn. *saidal*. Note loss of *r* in Pequot, represented by *l* in Abn.

COCHISE old man (*kũchă'is*) = N. *kehchis*, pl. -og; Abn. *kchayi* from *k'chi* = big, great. Cf. s. v. GUNCHE.

COOKSKI sleep, 3 p. (*kũ'kski*). This is a Brothertown word and must be cogn. with N. *kussukkoueu* he sleeps like a stone.

CORJUX boy (*kũjũ'x*). An abbreviated form of *muckachucks*, q. v.

COWISH go to sleep (*kăwĩš*) = N. *koueu*; *yo cowish* sleep here. Cf. D. *gauwin*; Abn. *kawi* he sleeps. In *cowish* the -š is the sign of the inv.

CUCHATUNG CIDI will you have some cider (*kũchũtũng săidăi*) = Abn. *k'wajonem* you have.

CUDDUSK six (*kũdũsk*) = Stiles *necquddosk*; N. *nequttatash*.

CUDERCUM he is sleepy (*kũ'dũkũm*) = N. *kodtukquomunat* (partc.); D. *ngatungwan* = I sleep. The first part of this word contains the Abn. *kadawi*- wish, desire.

CUDGI it is ready, finished (*kũ'ji*). This is really a sign of the passive; cf. *cudgi wĩgăũ* it is already done. I believe *cudgi* = Abn. *kizi* sign of the past tense. In N. *quoshappu* means he is ready; quite a different stem. Cf. *cudgi dupkwoh* it is already night; *cudgi nunchedah* it is already sought after, etc. See NUNCHEDEDUSH.

DEBE, pl. -ug = evil spirit (*dĩbi*). See JEEBI.

DEBECORNUG hell (*dĩbikănă'g*). See JEEBICORNUG.

DIKWADUNG drunk (*dĩkwă'dũng*). The word occurs also in the form *dĩkwă'gyă'n*. A difficult word, perhaps cogn. with Abn. *wijes-mowinno* a drunkard? Cf. Oj. *menikweshkid* toper. See s. v. GERKEEWOH.

Do and. See DOCKER.

DOBBY can (*dă'bi*) = Abn. *tabi* enough; D. *tepi*. In N. we find *tăpi* it is sufficient and *tapenum* he is able. In Pequot, *dobby* precedes the verb-form, i. e. *dobby ge kedersu* can you read?

DOCKER and (*dũ'kă*) = Abn. *ta + ka* = N. *kah* and. See Do.

DODDI where (rel. *dôdă'i*) = *dô + dăi* = Abn. *tali*. *Dô* = Abn. *to-ni* where, when. For *di*, cf. NEDI, YEOWDI. The elements of the Abn. *toni* appear in N. *uttiyeu* where; Narr. *tonati*.

DOOSETAR Tuesday (*Dû'sātā*).

DORBE table (*dā'bi*). Eng. loanword.

DORKES turkeys (*dāikis*). Loanword, also in D. *tschikenum* turkey, from Eng. 'chicken.' Abn. *nahama*; N. *neyhom* = turkey.

DORNUPS turnips (*dānū'ps*). Eng. loanword.

DOZORTAR Thursday (*Dō'zātā*).

DUCKSORS rabbit (*dū'ksās*) = Stiles *tupsaas*; a pure Pequot word. Cf. RW. *wautuckques* and N. *mohtukquasog*, pl. rabbits, from a different stem.

DUCKSUNNE he falls down (*dū'ksūnī'*), perhaps cogn. with N. *nu'k-shean* it falls down. Cf. Abn. *pagessin* it falls, said of a thunderbolt.

DUCKWONG mortar (*dūkwā'ng*) = N. *togguhwonk*; RW. *tācunuk*; Abn. *tagwaōgan*; D. *tachquahoakan*, all from the stem seen in N. *togkau* he pounds. See TEECOMMEWAAS.

DUNKER TEI what ails you? (*dūn kētiā'i*). *Dūn* = Abn. *tōni* what; *ke* is the 2d pers.; *t* is the infix before a stem beginning with a vowel, and *iāi* is the verb 'to be.' Cf. Abn. *tōni k-dāyin?* 'how are you,' or 'where are you?'

DUPKWOH night, dark (*dū'pkwū*) = Abn. *tebokw*. Loc. of *dū'pkwū* is *dū'pkwūg*.

EEN, pl. *eenug* man (*in, i'nūg*) = N. *ninnu*, seen also in Abn. *-winno*, only in endings. Cf. Ojibwe *inini*. Trumbull says, in ND. 292, that N. *ninnu* emphasizes the 3d pers., and through it the 1st pers. Thus, *noh*, *neen*, *n'un* 'he is such as this one' or 'as I am.' *Ninnu* was used only when speaking of men of the Indian race. *Missinūwog* meant men of other races. See SKEEDUMBORK.

EWO, EWASH he says, say it; inv. (*i'wō, i'wāš*). This contains the same stem as Abn. *i-dam* he says it. Cf. also RW. *teagua nteawem* what shall I say? In Peq. *nē-iwō* = I say, without the infixed *-t*.

GAWGWAN. See CHAWGWAN.

GE, GER you (*ge*). This is a common Algonquian heritage. Cf. N. and RW. *keen*; D. *ki*; Oj. *kin*; Abn. *kia*; Pass. *kil*; Micmac *keen*; etc.

GEESHQUDDU he is angry (*gi'skwūdü*) is apparently not equivalent to N. *musquantum* (acc. to Trumbull from *musqui* red and *-antum* a state of mind?). Also Abn. *muskwaldam*.

GEESHTUTUSH wash thyself (*gi'stūtūš*) = N. *kutchissetaush* wash thyself; Abn. *kaziljōmuk*.

GEESK day in *yougeesk*, q. v. (*gisk*). See GEESUKOD.

GEESUKOD day (*gi'z'kūd*) = C. *kesukod*, RW. *keesakat*, N. *kesuk*, Abn. *kisgad*, D. *gischquik*.

GEETUZUG cattle (*g'i'tüzüg*) = RW. *netasûog*, N. *netassu*, pl. -og. In Pequot *geetus* is the singular.

GEEZUSHG sun (*g'i'zû'sg*) = RW. *kesuckquand* the sun as a god ; Abn. *kizos*, D. *gischuch*. Stiles gives *mecun* as the sun.

GEI chair (*gi'd'i*). I believe this is a corruption of Eng. chair.

GERKEWOH drunk (*gëk'i'wü*) = D. *kee cakéwous* thou art drunk, from Salem Town Records, Lib. B (Trenton, N. J.). The N. cognate is *kogkeissippamwaen* he is drunk ; *kakewaü*, he is mad, crazy, ND. 30.

GERMOODU he steals (*g'mû'dü*) = Narr. *kamootahick* thieves ; N. *kummuto* ; Abn. *kamodnamuk* one steals. See *Am. Anth.*, v, 205.

GERSUBERTOH it is hot (*g'sû'bëtö*) = RW. *kusópita* ; Oj. *nkijob* I am hot in a house ; N. *kussitau* it is hot. See GERSUDAH.

GERSUDAH it is hot, said of the weather (*g'sû'dä*). See GERSUBERTOH.

GERSUG mud (*g'sû'g*) also *gersuggayoh* it is muddy (*g'süggäyö*). This must be cogn. with N. *pissag* mire, mud, with *g* for *p*.

GERTAKWISH going to (*g'tâwî's*) ; *g* + *t* + *awi* + *š*. For *awi*, cf. N. *awi* he goes, ND. 267. I believe this is cogn. with Abn. *kadawi*, the sign of the future, where the *k*- is part of the root and not the second person. The *k* in *gertakwish* is nothing but the common Algonquian rough breathing. See GETAHWE.

GERTINEMONG he helps you (*g'tî'nemöng*). Cf. *nîwöti'nemöng* he helps me, *Am. Anth.*, v, 204. The stem is *wotine* q. v. and cf. RW. *kuttannumous* he helps thee. In Abn. there is an inherent *k*, as in *kdemoñgalmi* help me, where *k* is not the 2d pers. The N. stem is *annumaoh* he helps him, which is probably a cognate.

GERTUB you stay (*g'tüb*). Here *k* is the 2d pers. ; *t* is the infix before the vowel, and *üb* is the stem. Cf. Abn. *wä-abin* he stays, sits ; N. *nuttappin* I sit ; *weetappu* he sits with him, etc. In Peq. *gëtä'wî түбö* = he is going to stay, for *wutubo* = 3d pers.

GERTUHMAH he sings (*g'tû'mā*), pl. *gertuhmāk* they sing = N. *ketuhom* he sings. This *ketu-gertuh* = Abn. *kadawi* seen in *kadawintödit* they who sing. The original stem is evidently seen in N. *unnuham* he sings. Abn. *kadawintödit* really means "those who wish (*kadawi*) to sing."

GERTUMKISH get up (*g'tû'mkîsh*) ! The root is really *umki* ; cf. Abn. *ômiki*, arise, seen in *wä-ômikin* ; N. *omohku* he gets up. In Pequot also *nëgëtümki* I arise.

NE-GETAHWE I am going (*në-gîtä'wi*). See GERTAKWISH. This is used exactly like the Abn. *kadawi* ; cf. *në g'tâwî gištütüš* I am going to wash. *Gëtäwî түбö* = he shall stay.

GEYOMMON spoon (*gíyǒ'mǒn*) = Abn. *amkuôn*; C. *kunnaum*, *quonnam*.

GIGETOOKER he talks (*gígětǔ'kū*) = N. *kekwtau* he talks, *keketwkau* he speaks well or is fair spoken.

GIGETOOKERWONG language (*gígětǔ'kěwǒng*) with the regular abstr. ending *-wǒng* = Abn. *ôgan*, Pass. *-âgun*. Cf. N. *Indianne unnont-wuwaonk*, *hettuwonk* language, from *hettuog* they talk together.

GOGGEY depart, get out (*gǒgi*) = Abn. *kíwajek* outside; cf. *Am. Anth.*, v, 204. N. *pohguaddit* outside; RW. *puckquatchick*.

GOGGWON what (*gǎ'gwǒn*) = *chawgwan*, q. v. Note hard *g* for *j*, a frequent occurrence in Pequot-Mohegan.

GOONE fallen snow (*gûn*) = N. *kun*; D. *gûn*; but Abn. *psôn*. See SOOJPOH.

NE-GOONGERTOON I am thirsty (*ně-gû'ngětûn*). Cf. N. *nukkokutun* I thirst.

GOONGEYOX cock, rooster (*gû'ngěyǒks*). I seem to see a cogn. for this strange word in Stiles *kohunk* a goose? The N. word for 'cock' is *monshnâmpash*. Abn. = *ahamô*.

GOONGOO, pl. *goongerwonch* stocking (*gûngû, -wānch*). Stiles *cungowuntch* a stocking, but this form is plural. RW. *caukoanash* leggings, inan. pl.; D. *gagun*.

GOOPKWOD a cloudy day (*gû'pkwǒd*). The last element is *-kwod* day, seen in all the Algonquian idioms. I find no cognate for *gûp*.

GORDUNCH take off, inv. (*gǎ'dû'nsh*), cogn. with N. *kodtinum* he draws off.

GOSH cow, pl. *goshenug* (*gāsh, -enug*). Eng. loanword. Cf. Abn. *kaoz*.

NE-GOWWE I sleep (*něgā'wī*) = Abn. *kaŵi*; D. *gaŵin*; N. *kouen*. See COWISH.

GUNCHE big (*gûnk'chī*). The *k*-sound pronounced but not written by Mrs Fielding is interesting, as it shows that this is a reduplication from *k'chī* big, great (all Algonquian). With *gunche*, cf. Abn. *kwontsi* and N. *kehshe*, in compounds *keht*, as in *Kehtannit* the great God.

GUNDERMON gentleman (*gû'ndûmǒn*). Eng. loanword, valuable only as showing the Pequot hard *g* for *j*.

GUNG young. See GUNGGUMB.

GUNGGUMB young man (*gûng-gû'mb*) is plainly a corruption of a form like N. *nunkomp* youth, from *nunk*- light + *omp* = man; seen in RW. *skeetomp*; Pass. *skitap* man. See GUNG-SHQUAWS.

GUNG-SHQUAWS young girl; corr. of N. *nunksqua*; Abn. *nôxkwa*.

GUNGWEEKSUMA somebody whistling (*gŭn-gwīksŭmā*). This prefix may be an abbreviation for *chawgwon*? See GWEKSU.

GUNIUSH long, inan. pl. (*gŭnā'īūš*) = N. *gunni*, Abn. *kweni*.

GUSHKÆRCHUNG spirits' light from punkwood (*gŭškēchŭng*). No cognate.

GWART quart (*gwārt*). Eng. loanword.

GWEKSU he whistles (*gwi'ksŭ*) = Abn. *kikwso* he whistles and *kikwso-wôgan* whistling. See GUNGWEEKSUMA.

GWUNSNOG pestle (*gwunsnâg*) = N. *quinahsin*, lit. 'a long stone,' from *gunni* + *assun*. See SUN.

HOXENUG oxen (*hō'xēnŭg*). Eng. loanword. Cf. Abn. *aksen* an ox.

HUNGGACHY handkerchief (*hā'ngēchâ'i*). Eng. loanword. Cf. Abn. *moswa*, from Fr. *mouchoir*.

HUZZEES horse (*hŭzī's*). Eng. loanword. Cf. Abn. *ases*; Pass. *ha-as*. Eliot has *horsesug*, pl., but the form *nahnaiyeumooadt* 'creature that carries' occurs in Natick. Cf. D. *nanayunges* (Heckewelder Correspondence, 402).

IKEKUZOO he works (*âiki'kŭzŭ*) = Abn. *aloka*; N. *anakausu* he works; *nuttanâkous* I work. Here again we have the elided *l-n* in Pequot. *Âiki* = *aloka-anaka*.

IKUNZOO work (noun *â'ikŭnzŭ'*). See IKEKUZOO.

INCHUN Indian (*ī'nchŭn*), seen in *Inchineen*, i. e. Indian man + *een*, q. v. Eliot has *Indian* which was no doubt pronounced *inchun*.

JEEBI spirit (*jī'bâ'i*) = Stiles *chepy*; N. *chippeog* ghosts; Nanticoke *tsee-e-p* a dead man; Abn. *chibai*; D. *tschihey*. All these words come from a stem *tsip-chip* to separate, i. e. a spirit is something separated from the body. The form *debe* (*dibi*) also occurs in Pequot with an approach to palatalization. See DEBE.

JEEBICORNUG hell (*jībāikâ'nŭg*). This probably contains the elements *jeebi* and *ohke* land, i. e. spirit land. See DEBECORNUG, and cf. *Am. Anth.*, v, 203.

JEETS bird (*jīts*) = Abn. *sīps*, with palatalized sibilant and change of *p* to *t*. The N. was *puppinshaas*, from a different stem.

JOCQUEEN house (*jō'kwīēn*). This is a most difficult word. In N. *chokquog* means 'an Englishman,' i. e. 'a knife-man,' with reference to the sword; cf. Oj. *kitchimûkumân* 'big knife' = 'English.' On the other hand, Oj. *jaganash* 'Englishman' seems to be cognate with N. *chokquog* 'Englishman.' I am tempted to see in Pequot *jocqueen* the word for Englishman, i. e. *jog* = the element for 'knife' = 'Englishman' + *in* 'man.' If the word really meant 'house' in Pequot according to Mrs

Fielding, it meant 'English house' as distinct from a wigwam. The regular N. word for house was *komuk* = Eng. house, but *wētu* was the Indian dwelling; cf. *nekick* my house RW.; Abn. *wigwôm*; Pass. *wig-wâm*; Oj. *wigiwam*, all of which words contain the stem *wig-wik* dwell. Is it possible that *jocqueen* has this stem in the inverted *kwi*? — i. e. *jo-kwîn*? The whole question is doubtful and difficult.

JONNOW near? (*jěná'ũ*) is a doubtful word without cognate.

JOSHE so much (*jāshě*), as in *joshe goone* so much snow. Perhaps this is connected with Abn. *kasi* so much?

NE JOYQUATUM I am in a hurry (*ně-jâ'kwătũm*). This must be cognate with D. *schawi* immediately; *schauwessin* he makes haste. I can find no other cognate.

JOYQUISH be quick (*jöikwî'sh*) is evidently the imv. of the above.

JUNI crazy (*jünd'ĩ*) seen in *juni shquaaw* a crazy woman. No cognate.

JUNIAM a crazy man (*jünd'ĩũm*). See JUNI.

JUWHYYUSH anything warm, really 'warm yourself' (*jűwâ'ĩũsh*) is perhaps cognate with Abn. *awazi* warm yourself.

KEE dirt (*kĩ*) = Abn. *kĩ*, *akĩ*; N. *ohke*.

KEEDERSU he reads (*kĩ'dũsũ*) = N. *ogketam* he counts the letters, i. e. reads; Abn. *agida* count, read.

KEEG ground (*kĩg*), locative of *kee*, q. v. Cf. Abn. *kik* in the earth.

KEENUNCH carry (*kĩ'nũnch*) = N. *kenunnum* he bears it.

NE KEOWHIG I desire, want it (*ně-kĩō'wĩg*). This also means 'I must.' This must be the Pequot form of N. *quenauat* it is lacking, with elision of the *l* as usual.

KERCHUSH hay (*kűchű'sh*). This is the real word for 'hay,' cogn. with N. *moskeht*; C. *askusque*; Abn. *mskikw* grass. In *kűch'űsh* we have a metathesis *k-ch* = *s-k* in the other Algonquian words. See CHUGGUNCE.

KERMUMPSH NE you look at that (*kűműmsh nĩ*) = N. *womompsh* look down; *moneau* he looks at him. All these stems are cognate with *nam* see. See NAWAH.

KIYO WETUN cold wind (*kâ'iyâũ wítũ'n*) = Abn. *tka*; Pass. *tke*; RW. *tahki*, *tatakki*. See WETUN. *Kiyo* also occurs in *kiyo zoogeryon* cold rain = Abn. *tka zoglon*. See ZOOGERYON and TEKIYO.

NE-KŌNŪM. I see. See NERMU.

KOUNKETOUN cider (*kű'nkítũn*). See CIDI. Probably cogn. with *goongertoon*, q. v.

GER-KUB your hat (*gěkű'b*) must be Eng. loanword from 'cap.'

KUNCHERCHEE only a little (*kű'nchěchi'*), also *chű'nchěchi'* = N. *ogguhse*; C. *ogkusse* a little.

KUNDEES leg (*kündi's*). Probably diminutive for N. *muhkont* ; RW. *wuhkont* his leg ; Abn. *ukôd* his leg.

KUNNUNG head (*kü'nüng*). This means also 'face, appearance.' No cognate.

LADEES lady (*lêdis*). English loanword.

MA sign of the past tense, as in *ne-ma-mud* I did not (*mā*). It also precedes the verb, as in *ma-ne-tish* I went. This *mā* may be an abbrev. of a form like N. *mahche* it has passed away, which appears in the form *mesh* ; cf. *tashin mesh commaug* how much have you given ? D. *matschi* already.

MANODAH a basket (*mānû'dā*) ; *n'manodah* = my basket. This is really 'a bag' ; N. *manud* ; Stiles *munnotgh*, probably pl. ; Abn. *manoda*. See BAGENOOD.

MEECH eat it, inv. (*mits'*) = N. *meetsu* he eats it ; RW. *metesimmin* ; D. *mitzin* in *kdapi mitzi* have you eaten enough ? Abn. *n'mitzi*.

MEEJO he eats it (*mî'jō*), seen in *n'meejo* I eat it. See above MEECH. Also *germeechyowon* = you eat it ; *n'mecjunne* I eat it.

GER-MEESH in *ma ne germeesh* I did give you (*g'mîš*). Cf. also *mus ne germeesh* I will give you. In *germeesh*, we have the *ger* of the 2d pers. (q. v.), which always has the precedence in Algonquian, + the root *mee* give = Abn. *√mil* seen in *n'milgon* he gives me. Cf. N. *magis* give thou ; RW. *mauks*. In Pequot the form *meezum ne* 'give me that' (*ne* = that) also occurs (*mî'zūm nî*) = Abn. *mîli* give me.

MEGEESHKUDDU he is lazy (*mîgîshkûdû'*). The root is probably *geesh* seen in D. *gicht-amen* he is lazy ; cf. Oj. *naegatch* slowly (?).

MEGERCHID dung (*mî'gêchid*), undoubtedly cognate with Abn. *magwi* dung.

MEGWON feather, quill (*mî'gwōn*) = N. *megun*, Abn. *miguen*, D. *mîgun*.

MEKEGOO he is strong (*mî'kîgû*) = Abn. *mlikigo* he is strong, with loss of *l* in Pequot. Cf. N. *menuhki* ; RW. *minikeon* strong.

MERDUPSH sit down (*mû'dûpsh*) inv. = RW. *máttapsh yoteg* sit by the fire ; N. *nuttappin* I sit.

MERKEAHWEES little boy (*mō'kiâ'wîs*). The common word is *muckachucks*, q. v. The first element in *merkeahwees* seems to be identical with that seen in *muckachucks*.

NE MERKUNUM I pick, gather (*ně-mā'kūnūm*) = N. *mukkinum* he gathers. Seen in Abn. *magamôldimuk* the place where they gather.

METOOG tree, stick (*mî'tû'g*) = D. *mehitt'gus* a twig ; Stiles *a'tucks* ; N. *mehtug*.

MINSHKUDAWÂPÛ whiskey. Brothertown word. Corr. of Oj. *ish-kotewabo* firewater.

MISHIAN little rain (*mîshâiän*). ND. 212 gives *mishinnon* great heavy rain. Perhaps *mishian* means a shower, i. e. a heavy but short rain; hence Mrs F.'s definition as 'little rain.'

MOHEEKS Mohegan, pl. *moheekseenug* (*möhîks-înüg*). This word also appears in the pl. form *Muheeganiug* (see *Am. Anth.*, v, 193). The word may be derived from *makhaak* great and *hican* tide-water (D.). It was first used to denote the Hudson River Mohicans and later applied to itself by the mongrel colony at Mohegan.

MOISH hen (*mōish*) = N. *mōnish*. Here again we note the Pequot elision of the *n*.

MOISHOCKS chickens (*mō'ishāks*) dim. of *mōish*, q. v.

NE MOOCHINA I am sick (*nēmū'chînā'*). This is cogn. with N. *machinau* he is sick; Abn. *machina* he dies, but note that in Pequot *müchünü* means he perishes, *Am. Anth.*, v, 206. See MUTTIANOMOH and MUCHUNU.

MOOSKUT anus (*mū'sküt*), distantly cognate with Abn. *wbeskuan* his back; cf. N. *muppusk* back.

Mow he cries, weeps (*mâû*, sometimes *mâwi*) = N. *mau*; C. *mou*; RW. *mauo*.

NE MOWE SUSMO I am coming to meeting (*ně-mâ'wî-süsmō*). *Ne-mowe* I go must be cognate with N. *ûmû* to go; also *ûm*, ND. 267. See SUSMOH.

MOYGOOWOG bad witches (*môigû'wōg*), perhaps = RW. *mannêtu*, i. e. *maune* or *manne* = *moy* in Pequot. Cf. D. *mallikuwagan* conjuration.

M'TARWE much very (*m'tâwi*).

MUCHUNU he dies (*müchünü*) = Abn. *machina*. See *Am. Anth.*, v, 206 and s. v. MOOCHINA.

MUCKACHUCKS boy (*mü'kächûks*) = N. *mukkatchouks*; RW. *muck-quachucks*; Stiles *muckachux*. See MERKEAHWEES.

MUD not, no (*müd*) = N. *matta*, *mat*; RW. *mattuks*; D. *makhta* also shortened to *ta* in D. This is a cognate with Abn. *onda*; Pen. *anda*. Pequot *mud* is always prefixed to the verb. See MUDDER.

NE MUD my brother (*nēmü'd*) = N. *wematoh* his brother; *neemat* my brother.

MUDDER no (*mü'dü*). This is exactly equivalent to N. *matta*.

MUDDORPOH he curses (*müdü'pâ*). Seen in *muddorpoñwor* he speaks evil. With *-wo*, *-wa*, cf. Abn. *-ona'wa*; Pass. *aduwe* speak. *Mud* in these compounds = *mutshe* bad, *Am. Anth.*, v, 205. N. *mattanumau* he curses him; Abn. *majalmukwzo*, *machdonkat* he curses.

MUDJOG GOONE the snow is gone (*mūjā'g gūn*). *Mūjā'g* = verb. 'to go'; RW. *mauche*, Abn. *môji*.

MUD-SHQUONU dull (*mūd-shkwō'nū*), lit. 'not sharp.' See SHQUONU.

MUGGAYAHSHA breathing hard (*mūgāyā'shā*), a combination of *mug-gayoh* big, q. v. + N. *nashauonk* breath, from *nahnasha* he breathes; Abn. *nasa* he breathes, *nasawan* breathing.

MUGGAYOH big (*mūgā'yō*) = N. *mogki* 'great' used in comparison. This N. *mogki* appears in the well-known word *mugwump* = N. *mogewomp* a great man, a captain. Cf. D. *machweu* large; Abn. *mahsihômuk* one makes large.

MUKUS shoe (*mūkūs*, pl. *-unsh*) = *mokus*, pl. *-enash*; Stiles *muckasons*; Abn. *m'kezenal*; Pass. *m'kussenul*.

MUNDETAR Monday (*mondētā*). Eng. loanword.

MUNDONOG heaven (*mündōnā'g*), from *Mundo* God, q. v., a very difficult compound. See *Am. Anth.*, v, 203.

MUNDU God (*mūwū'ndō*) = Stiles *mundtu*; N. *manit*; D. *manitto*; RW. *manittowock*, pl.; Abn. *madahôdo*, from the same stem 'devil.'

MUNEESH money (*mūnī'sh*). Eng. loanword. Cf. Abn. *mōni*.

MUS sign of the future (*mūs*). In N. *mos* means 'must.' Eliot has *mos* and *pish*, both for 'shall' or 'will,' but he distinguishes between them, saying that *mos* is obligatory and *pish* the pure future. RW. has *moce* in *mocenaneepceam* I shall come, and *mesh*. In Pequot *mus* is prefixed to the verb form, as *mus ne beyoh* I am coming (*mūs nē-biyo*).

MUSKERZEETS beans (*mūškēzī'ts*) = Stiles *mushqissedes*; but N. *tup-puhkwamash*; Abn. *tebakwal* from quite a different stem.

MUTAHGA he dances, pl. *mutahgahk* (*mūtā'gā*) = RW. *ahque matwākesh* do not dance; *mattwakkaonk* they are dancing, perhaps the war dance? Cf. RW. *matwan* enemy. I do not believe there is any connection here between "enemy" and "dance."

NE MUTCHETUM I spoil it (*nē-mū'tchitūm*), from *mutchi* bad; Abn. *maji*. See MUTCHI, MUTSHER.

MUTCHI bad (*mūchi*) = Abn. *maji*, N. *matche*.

MUTSHER it is spoiled, bad, said of eggs (*mūchū*). See MUTCHI.

MUTTIANOMOH sick (*mūtā'iānōmō*) = *mud* + *tāiā'nū* he is not in health. See NOOGER.

MUTTOUMBE pack-basket (*mutū'mb*) = Abn. and Pen. *madôbe*. This is the original of the Canada-English expression 'thump-line,' referring to the rope passing over the forehead of the carrier, by means of which these baskets are borne.

MUTTUDIAZOO he is ugly, hideous (*mūtūdiā'zū*). The first element

is *mut* bad, from *mutchi*. The word is compounded of *mut* + *ũdia* + *zu*. The middle element *udia* is cognate with N. *uttæ* wofully, the same stem seen in Abn. *n-udalldam* I am sorry. The ending *-zu* is the regular reflexive, seen in Abn. *akwamalso* he is sick.

MUTTYWOWOG good many (*mũtiwâ'wâg*), from same stem as N. *mut-tæ* many. Cf. M'TARWE.

NÂGUM he, she, it (*nâ'gũm*) = Pass. *nĕgũm*; N. *nâgum* (Eliot and C.); D. *neka*, *nekama*; Abn. *ag'ma*. See *Am. Anth.*, v, 206.

NE NAWAH I saw him (*nĕ-nâ'wâ*), same stem as Abn. *namio* he sees him; N. *naum*; Pass. *nim'iu* he sees him. See NERMU. *Nawah* really means 'know.'

NE I (*nĭ*, or before verb-stems *nĕ*). This is a common Algonquian heritage. Cf. N. *neen*; Abn. *nia*; Pass. *nil*; D. *nin*; Oj. *nin*, etc. See GE.

NE demonstr. pronoun 'that' (*nĭ*) = N. *ne*; Abn. and Pass. *nĭ*. See NISH.

NEBEECH woods (*nĕbi'ch*) occurs with loc. ending *-ug*. I believe Mrs F. is wrong in this word's meaning. *Nebeeche* can only mean 'lake' and not 'forest.' Cf. Abn. *nebes* lake and especially N. *nipisse* lake.

NEDI there (*nĭ'dâ'i*) = Abn. *ni-dali* with elision of *l*. See *Am. Anth.*, v, 204. The N. word for 'there' was *na-ut* in that place, with loc. ending *ut* = *ũk*, *ũnk* in the other Algonquian dialects.

NEES two (*nĭs*) = N. *neese*; Abn. *nĭs*; Stiles *naeze*, *neese*.

NEESWEEK fortnight (*nĭswĭk*). A hybrid from *nees*, q. v. and Eng. 'week.'

NEGUNNE gone first, really before (*nĭ'gõnĭ*) = N. *negonuhkau* he goes before; Abn. *nikõnta*; Pass. *nikani* before, in front. Abn. *negõni* also means 'old,' 'aforetime.' In Pequot I find the form *negun-neesh* go before, used as the inv. of a verb.

NEITSISSIMOÛ tobacco (*nĭtsi'simũ*). Brothertown word. Corr. of Oj. *assemã*.

NEKÂNIS my brother (*nĕkâ'nĭs*), a Brothertown word, taken from Oj. *nikanisi* my brother.

NENEQUDDER never, ever (*nĭnikwũ'dũ*) is cognate with Abn. *nikwôbi* now.

NENERTAH that is mine (*nĭ'nâ'tâ'*). This stands for *nĭ* = 1st pers. + *na* that + the demonstrative element *-ta*. Cf. *nĭ gĕtâ* that is thine, and see WOTOHEESH. N. *nuttaihe* = it is mine.

NEPOW five (*nĭpâũ'*) = Stiles *nuppau*; N. and RW. *napanna*.

NEQUT one (*nĕkwũ't*) = N. *nequt*; RW. *nquit*; Stiles *nuquut*; Moh. *ngwittah* (Edwards); Pass. *neqt*; D. *ngutti*.

NE NERMU I see (*ně-nā'mūñ*). This really means 'I see him.' Cf. *nawah* and Abn. *n'namio* I see him; Pass. *n'nim'io*; N. *nāum*; RW. *kunnunnous* I saw you. The form *nawah*, q. v., is probably a by-form of this stem. The *m* seems to be inherent in Algonquian dialects of the eastern coast. Cf. also D. *nemen*. The form *někōnūm* 'I see' looks suspiciously like the demonstrative *ne* + *kenaum*, 2d pers.?

NERPO he dies (*nūpā'*) = Abn. *nebowi*, *n'bowōgan* death. Cf. N. *nuppuwonk* death and *nuppu* he dies.

NERTERNEES my daughter (*nōtōnis*) = N. *wut-taun-oh* his daughter; Oj. *nin-daniss*; Abn. *nd-osa* 'my daughter' is clearly a distant cognate from the same stem.

NE NETUN I desire, want (*ně-nitū'n*) = N. *kodtantum* he desires.

NEZUSH seven (*nī'zū'sh*). Stiles has *nezzaugnsk*; N. *nesausuk tahshe*; D. *nischasch*. It looks as if *nezush* were a Mohican form, owing to the D. *nischasch* which it resembles more closely than the N. E. forms. The Narr. had another stem to denote this numeral, i. e. *enada* seven.

NICHIE my brother (*nīchi'*). Brothertown word = Abn. *nijia* my brother.

NISH inan. pl. 'those' (*nish*), pl. of *ne* that, q. v. The N. has *ne*, pl. inan. *nish*.

NOB in the following compounds = the word given by Stiles as *naubut* and has the meaning of multiplying and also of adding: NOBNEBIOG twenty (*nābnibā'io*g); Stiles *piugg naubut piugg* ten + ten; see BIOG. NOBNEBOZUKUKWONG nineteen; see BOZUKUKWONG. NOBNECHEWEE thirteen; see CHEWEE. NOBNECHEWEEOSK eighteen; see CHEWEE-OSK. NOBNECUDDUSK sixteen; see CUDDUSK. NOBNENEES twelve; see NEES. NOBNENEPOW fifteen; see NEPOW. NOBNENEQUT eleven; see NEQUT. NOBNENEZUSH seventeen; see NEZUSH. NOBNEYOW fourteen; see YOW. NOBNENEBOZUKUKWONG twenty-nine; note the double *ne*; I do not understand these forms; see BOZUKUKWONG. NOBNENECHWEE twenty-three; see CHEWEE. NOBNENECHWEEOSK twenty-eight; see CHEWEE-OSK. NOBNENECUDDUSK twenty-six; see CUDDUSK. NOBNENENEES twenty-two; see NEES. NOBNENENEPOW twenty-five; see NEPOW. NOBNENENEQUT twenty-one; see NEQUT. NOBNENENEZUSH twenty-seven; see NEZUSH. NOBNENEYOW twenty-four; see YOW.

NER NOHWA I know (*ně-nā'wā*) = N. *waheau* he knows, *nuwateo* I know. See ND. 285. Cf. Abn. *n'wawawinôwô* I know him. See NAWAH.

NOODASHA not enough (*nū'dāshā*) is perhaps equivalent to N. *noadt* afar off = Abn. *nôwat*?

NOOGER TIANER how are you? (*nû'gütâä'nû*) = N. *nuhgeu* so far as, so much. I believe *nooger* contains the same element as that seen in Abn. *paakui-nogw-zian* how are you?

NORNER my grandmother (*nâ'nû'*). Is this cognate with D. *ohum* grandmother? The N. has *ukummes* which is well known in Oj. *nokomis* my grandmother. See OOGERNOS.

NORNUNG my mother (*nâ'nû'ng*). I can find no cognate. Abn. has *nigawes*; Pass. *nigwus*; RW. *nokas*; D. *okasu* his mother. The Oj. *ninga* 'my mother' is nearest to *nornung*.

N'SHUH he kills (*n'shûñ*). Cf. N. *nushau*; RW. *niss*; Abn. *w'nihlô* he kills, murders him. The Abn. form is only distantly cognate, if at all.

NUK yes (*nûk*) also *nûks*. Stiles gives *nux* which Exp. Mayhew states was really pronounced *nukkies* in two syllables. RW. also has *nûk*. See NYE.

NUNCHEDUSH go after, inv. (*nû'nchîdûsh*). I find in N. *natinneham* he seeks after. Is this cognate?

NUNEBISHKOOT bad (*nûmbâ'ishkû't*), an error for *noombishkoot*. This is cognate with Abn. *eskawai*; i. e. *âishkû* = *eska-wai*.

NUPPE water (*nûpi*) = N. *nippe*; Abn. *nebi*; Stiles *manippêno* have you no water?

NUTTEAH dog (*nâ'tiû'*) pl. *nutteahsug* (*nâ'tiû'sûg*). This is pure Pequot; see De Forest p. 491, where the doubtful form *ndijau* 'dog' is given as coming from the Hudson River Mohican. In N., however, we find *anum*; RW. *ayum*; D. *allum*; Abn. *alemos*; Pass. *ul'mûs*, all cognates together.

NYE yes (*nâi*). See NUK.

OBBUD he is, he being (*â'bûd*) = Abn. *abit* where he sits. Cf. N. *appit* where he sits, from *appu*.

G-OOGERNOS thy grandfather (*gû'jênôs*). The pronunciation *gû'gênôs* with hard *g* is also given by Mrs F. This form makes me suspect a relationship with the Oj. *kokummes* thy grandmother = D. *muchomes*; Abn. *mahom*. See NORNER.

OOPSGS hair (*ûpsks*). I do not believe that this word means 'hair,' but 'back'; cf. N. *uppusk* 'his back,' from *muppusk*, ND. 70. In N. 'hair' is *mcesunk*; RW. *wesheck* his hair. The Abn. *wdupkuan-al*, pl. 'hairs' from *mdup* head; N. *muppuhkuk*. This is a different stem.

OOSH his father (*ûsh*) = N. *ushoh* his father, literally 'the one from whom he comes'; see WOCHI. Cf. D. *ooch* and see *Am. Anth.*, v, 209.

ORNEKS given by Mrs F. as 'mouse,' but probably the equivalent for any rodent; cf. N. *wonogq* a hole, burrow; Abn. *wôlakw* a hole.

The word is pronounced *â'niks*. The last part of the word *-iks* may be cognate with Abn. *wôbikwosos* mouse. See SQUONNEEKS.

ORSEED river (*â'sî'd*). I can find no cognate here.

ORWON who, someone (*â'wôn*) = N. *howan*; Abn. *awani*; Pass. *wen*; Pen. *aweni*; D. *auwenen*; Oj. *awenen*.

PAPOOSE child, baby (*pâ'pûs*) = RW. *papoos*; Stiles *pup'pous*; N. *papeases*. The word is evidently a reduplication of *pea* 'little,' seen in Abn. *piusessit* he is little.

PEORMUG fish, pl. (*pî'âmâ'g*). This must mean 'a little fish,' i. e. *pî* + *âmâg*. Cf. N. *mogke-amaugq-ut* 'great fishes,' where *amaugq* = fish. See the next.

PEORMUG CHAW to fish (*pî'âmâ'g châ*). The N. form for 'fishermen' is *negomâcheg*; RW. *aumâchick*. For *amag*, cf. Abn. *nd-aman* I fish; RW. *aumai* he fishes.

PISKUT penis (*pî'shkût*). No cognate.

GER-POONCH you shut (*g'pû'nsh*). The stem is *pûn* = N. *ponum*; imv. *ponsh* put thou. Abn. *nbonumun* I put it. In Pequot also the imv. *pûûnûnch* 'put it' occurs. Peq. *n'pûnûm* = I laid down something.

POSHER light rain, drizzle (*pâshâ*). No cognate.

POYANTUM he starves (*pô'yô'ndûm*), probably a distant cognate with N. *paskanontam* he is starving? See YUNDUM.

PUDDEENCH arms, inan. pl. (*pûdi'nsh*) = RW. *wuppittênash* his arms; N. *muhpit* arm; Abn. *upedin* his arm.

NE PUDDUM I hear (*nêpûdûm*) also *wopuddumun* he hears, *Am. Anth.* v, 206. This is identical with Abn. *podawazina* let us take counsel. Cf. D. *pendamen* he hears. The N. for 'hear' is *nutam* = Abn. *nodam* from another stem.

QUAHAUG clams (*kwâhâ'g*) = RW. *poquauhock*; Stiles *pouhquahhaug*, *piquaughhaug*, clams. This is the round clam = *Venus Mercenaria*. Note that Mrs F.'s form has lost the *p*-prefix.

QUINNEBAUG long pond (*kwî'nêbâ'g*) = Abn. *kwenôbagak* from *kwenô* long + *baga* water, pond, only in composition. In N. the ending *pog-paug* has the meaning 'water,' 'lake' in composition.

QUDDUM he swallows (*kû'dûm*). In N. we find *qusséashk* he swallows; Abn. *kwazilômuk* one swallows. See QUDDUNG.

QUDDUNG throat (*kû'dûng*) = N. *mukqutunk* throat; RW. *quttuck*.

QUGGEY he tries (*kû'gî*) = N. *qutchehtam* he tries; Abn. *n'gwagwaji* I will try.

NE QUNNA I catch (*nê-kû'nû*) = N. *tohqunau mosquoh* he catches a bear; D. *achquoanan* he catches with a net.

QUOGQUISH run, imv. (*kwa'gkwish*) = Stiles *koquish*; RW. *quogquish*, *quogqueu* he runs.

QUOJUG out of doors (*kwa'jug*) = N. *po-quadche* outside; RW. *puck-quatchick*; Abn. *kwajemiwi*; Minsee *quotschemink*.

GER-QUOMMUSH he will bite you (*gukwō'mūsh*). In Oj. I find *nin takwange* I bite. Is this a cognate? *Kwange* = *quom*?

QUONWEHIGE it frightens me (*kwañwihāig*) must be cogn. with N. *queihtam* he fears. The Pequot form should have *n*-prefix; thus, *ne-quon-wehige*, to denote the 1st pers.

QUOTSTUMPSH taste, imv. (*kwa'tstū'msh*) = N. *quetchtam* he tastes. The *-p-* in Mrs F.'s form is unnecessary. Cf. also in Pequot *ne qutsh-tumun* (*ně-kūchtūmūn*) I taste some, with the definite ending *-un*.

QUTSHETUSH wash yourself, inv. (*kūchitūsh*) = N. *kutchissitau* he washes himself; *kutchissumwush* wash thyself; D. *kschieche*; Abn. *kazebaalōmuk* one washes.

QUTSUG lice (*kū'tsūg*). This in N. was *yeuhquog*. *Kuts* in N. = a cormorant!

SABASHAH it melts (*sābā'shā*) = N. *sabohteau* it melts, from *sabae* it is soft.

SEBOOD anus (*sēbū'd*). I find this also in the River Mohican word *šepūti* preserved by James Harris of Kent, Conn. It has as its cognate D. *saputti*.

SEBOIS a little brook (*sī'bōi's*) = N. *sepuese* a little river, with dim. ending *-eese*, is.

SEBOOG brook (*sī'būg*). This is really a pl. = rivers. Cf. N. *sepuash*, inan. pl.; Abn. *sibo-al*.

SEDUSH feet, inan. pl. (*sī'dūsh* and *sī'dūnsh*) = N. *musseet*; Stiles *cuszeet* thy foot; Abn. *mezid*.

SEGUISH come in! (*sūgwī'sh*). No cognate, unless it is connected with *shquond* door, entrance, which is probable. See SHKWUND.

NE SEWORTUM I am sorry (*nī sīwā'tūm*) = Abn. *n'siwa'tum*.

SHENEE that (*shēnī'*). The last element is the demonstr. *nī*, but I cannot find *sh-* anywhere.

SHKOOK snake (*shkūk*) = N. *askuk*; RW. *askug*; Stiles *scoogs*. Speck found *shkook* in the mouth of a Poospatuck Indian near Bellport, L. I. Cf. Abn. *skog*; D. *achgook*.

SHKUNSH bones (*shkūnsh*), inan. pl. of *shkun* = N. *muskon*, pl. *muskonash*; D. *wochgan*; Abn. *uskan*.

SHKWUND door (*shkwünd*) = N. *squont*, *squontam*; RW. *squontáu-muck* at the door; D. *esquande*. Anthony says this means 'the threshold'; rather than 'the door.' This harmonizes with *seguish*, q. v. The Peq. loc. is *shkwündā'g*.

SHMOKERMAN white man (*shmō'kēmūn*). A Brothertown word = Oj. *kitchimūkkēmān* big knife.

SHPUCK meat (*shpūk*). A Brothertown word, with no cognate. All other Algonquian idioms have *wias* in some form. See WEOUS.

SHQUAAW woman; pl. *shquaauwsuk* (*shkwā*) = N. *squaas*; C. *eshqua*; RW. *squaws*. The forms are undoubtedly connected with the D. *ochqueu*; Oj. *ikwe* and Pass. Micmac *ēpit*. The meaning of the stem was the prepuce. I see in Mohican *pghainoom* the same stem inverted, which appears also in Abn. *pehanum*; N. *penomp* virgin. There is of course no connection between Abn. *pehanum* and Fr. *femme*, as Trumbull thought.

SHQUAWSEES a little girl (*shkwāsīs*) = Narr. *squahsees*; D. *okhquet-schitsch*.

SHQUONU sharp (*shkwō'nū*) = Abn. *skuahigen* it is sharp. Cf. also N. *kēna*, *kēneh*; D. *kihneu*, *kihnsu*.

SKEEDUMBORK people (*shkī'dūmbāk*) = N. *woskētomp*; RW. *skeetomp*; Pass. *skitap*. The ending *-omp*, *-ap* appears as *-āpe* in D. and as *ōba* in Abn. See *Am. Anth.*, v, 203.

SKEESHU quick (*shkishu*) = Oj. *kejidin*.

SKEESUCKS eyes (*shkī'zūks*) = N. *muskezuk*, *muskezuk* my eye; RW. *wuskeesucks* his eyes; Stiles *skeezucks*; Abn. *msizukw* eye, face.

SKUNX skunk (*shkūnks*) = Josselyn *squnck*; Abn. *sgôgw*; Oj. *shi-kaug*, hence *Chicago* 'place of skunks.' The Pequot of Stiles was *auso-wush*, from a different stem.

SKWISHEGUN head (*skī'shēgūn*). Brothertown word. The nearest to this is Oj. *oshtigwan* his head. The connection is doubtful.

GE SOOJEPOOG neck (*g'sū'jēpūg*). This is really 'your neck.' Cf. N. *mussittipuk*; RW. *sitchipuck*, *wussittipuk* his neck, pl. = *-anash*.

SOOJPOH snow falling (*zū'tspō* and *sū'jpō*) = Stiles *souch'pon*; RW. *sochepuntch* when it snows; Abn. *pson* with metathesis. See GOONE.

NE SOOKEDUNG I urinate (*nēsū'kidūng*) = Abn. *ngade-sugi* I want to urinate; N. *noh sagkeet* he who urinates. From the same stem as Abn. *sognem* he pours out; N. *sokinnum*.

SOOKTASH succotash (*sū'ktāsh*) = RW. *msickquatash* corn (pl.) boiled whole; *msukquttahhaš* things (inan.) beaten to pieces, from *sukquttaham* he beats.

SOOME too much (*sū'mi*) = N. *wussaume*; C. *wussomme*; Abn. *uzômi*; D. *wsami*.

NE SOSUNNE I am tired (*ně-sā'sūnī*); also *gēsā'sūnī* 2d pers., and *sā'sūnī* 3d pers., *Am. Anth.*, v, 207. Cf. RW. *nissowanishkaumen*;

Abn. *n'zao'to* I am tired. The Pequot form is a reduplication of N. *sauunum* he is tired.

SQUAYOH red (*skwā'iō*); N. = *musqui*, *msqui*; RW. *msqui*; Abn. *mkui*; D. *machkeu*. Stiles gives a curious form with *p*, i. e. *mes'piou*. *Squayoh* has lost its *m*-.

SQUONNEKS red squirrel (*skwāni'ks*); Stiles *shenneague* and *m'ushanneege*; RW. *anequs*. See ORNEKS. In Abn. *anikwes* = a striped squirrel. The old word was probably pronounced with *r* as is so often the case, i. e. *squorreks*. The first syllable is from *squayoh* red, q. v.

SUGATUCK negro (*sū'gātūk*). Probably pl., i. e. *sukit* he who is black + *uk*. In RW. *sucki* is black = Abn. *mkazawit* a black man. See SUGGAYOH.

SUGGAYOH adj. black (*sū'gā'yō*). See SUGATUCK.

SUN stone (*sū'ēn*) = N. *hassun*; D. *achsin*; Abn. *sen*; Pass. *s'n*.

SUNJUM sachem (*sū'njūm*) = Narr. *saunchim*; Stiles *sunjum*; N. *sachim*, from which the Eng. sachem. Cf. Abn. *sō'gmō*; D. *sakima*.

SUNKATIDDEYORK stingy ones (*sū'nkātid'yā'k*) pl. = RW. *sun-nukehteau* he crushes, *sunnuchig* a crushing instrument. Cf. Abn. *nesekekenemen* I press it. The same idiom prevails in colloquial English when one speaks of a 'close' man.

SUSMOH meeting (*sū'smō*). No cognate.

TAH heart (*tā*) = N. *metah*, *nuttah* my heart; D. (Heckewelder) *wdee* his heart; Moh. (Edwards) *utoh* his heart.

TAHBUT NE thanks (*tā'būt nī*); Lit. thanks for that = *nī*. Cf. N. *tabuttantam* he is thankful; C. *kuttatobomish* I thank you, from *tapi* enough, sufficient + *antam*, denoting a mental condition. It literally means 'to be satisfied.' The same idiom prevails in Arabic and Turkish *ana memnūn* (Ar.), *memnūnim* (Tk.) I am content, i. e. thank you.

GER-TEE you do (*gēti*). Same stem as in Abn. *kizi-t-o* he does; N. *wuttussen* he does so.

TEECOMMEWAAS a family name (*t'kü'mwās*). This name is said to mean 'striker' and probably correctly. Cf. N. *togku* he strikes, and see s. v. DUKWANG. I cannot explain the ending *-waas*.

TEKIYO cold (*t'kā'iyō*) = Abn. *tka*; Pass. *tkē*; RW. *taquonck* autumn. Note RW. *tupu* frost with *p* for *k*. See KIVO.

TETE rap-rap, used in a story to indicate the sound of knocking (*tī-tī*).

TIANER. See NOOGER (*tāiā'nū*).

NE-TIATUM I think (*nē-tāiā'tūm*) probably for *taiantum*. Cf. the N. *-antum*, denoting a state of *mind*, as in N. *nuttenantamun* I think it; in Abn. *ndelaldam*. See YERTUM.

TIONDEES liar (*tâ'ïöndi's*), probably connected with *taiantum*?

NER-TISHOR I went (*něti'shā*); the last part is evidently *au* = go, ND. 267-8, perhaps = N. *ussishau* he hastens.

TORDUS potatoes (*tâ'dūs*). Cf. Abn. *padates*. Eng. loanwords.

TOWUG ears (*tâ'ūwūg*) = N. *mehtauog*; Stiles *kutturwaneage* your ears, from *wahtean* he perceives. Cf. Abn. *watawagwit*; D. *whittawack*.

TUDDUM he drinks (*tū'dūm*) = N. *wuttâtam* he drinks; *wuttattash* drink thou, inv.

TUGERNEEG bread (*tū'gēnig*) = RW. *petukqueneg*.

TUGGUNG axe (*tū'gūng*) = N. *togkunk*, lit. 'a striker' from same stem as *teecommewaas*, q. v.; also see DUCKWONG.

TULEPAS turtle (*tū'lipās*) = Abn. *tolba*; Old Abn. *turebe*. This stem is not in Natick.

NE TUMERSUM I cut (*ně-tū'mēsūm*) = N. *tummussum* he cuts it off. Same stem as *tamahigan* an axe (Abn.).

TUMMOUNG a pipe (*tūmū'ng*) = Stiles *wuttummunc*; Abn. *wadamon* tobacco.

UMBUSK medicine (*ūmbū'sk*). Cogn. with N. *moskeht*; RW. *maskit*? Or does *umbusk* contain the root for water (*nuppe*, q. v.), as in Abn. *nbizonal* medicines.

UMKI. See GERTUNKISH.

UMSQUE blood (*umskwe*) = RW. *mishque*; N. *musquehonk*. This word contains the stem 'red.' Cf. D. *mehokquish* bloody.

UN is the definite ending in verbs, as in Pequot *nepuddumun* I hear it, but *nepuddum* simply 'I hear.' Cf. Abn. *n'wajonem* I have, but *n'wajonemen* I have it.

UNDI then (*ündâ'i*). See *Am. Anth.*, v, 207.

UNGERTUG dark, cloudy (*ū'ngūtūg*) = RW. *mattaquat*; N. *matokqs* cloud.

UNGOOZE pray, not in N. (*ūngūz*). Note 2d pers. *g'ōngū'z*, *Am. Anth.*, v, 206. Cf. Abn. *winawoñz-wigamigw* a house of prayer; D. *wundangunsin* he prays for him.

UNKSHOH he sells (*ū'nkshā*) = Abn. *onkohlōmuk* one sells.

UNKUPE rum (*ūnkūpi'*) = Abn. *akwbi*; N. *onkuppe* strong drink.

WAHBAYOH windy (*wābā'yō*) = N. *waban* wind. See WETUN. In N. we find *waapu* and *waaben* the wind rises.

WAHSUS bear (*wā'sūs*) = Abn. *awasos*; Pen. *awesos*; N. *mosq*. Stiles gives a word from an entirely different stem; viz., *ahawgwut*.

WEBUT his tooth (*wi'būt*); RW. *weepit*; N. *weepit* his tooth; Stiles *meebut*, the original form = Abn. *wibidal* teeth; D. *wipit*.

WEECHU he laughs (*wi'chû*). No cognate.

WEEGWASUN good-morning (*wîgwâ'sûn*). This is the common Mohegan-Pequot salutation. It probably means 'may you live happily' from the root *wig*. I do not understand *weegwasun* as it is given by Mrs F. Not in Natick.

WEEKCHU he is handsome (*wik'chû*). Same stem as *wiktûm*. See NE WEEKTUMUN.

WEEKSUBAHGUD it is sweet (*wiksûbâ'gûd*). Cf. WEEKCHU. See N. *wekon* sweet.

NE WEEKTUMUN I love someone (*ně-wi'ktûmûn*). From the same stem as Abn. *n'wigiba* I would like, really 'I love it.'

WEESHAWGUNSH they are hairy (*wi'shâgûnsh*). This seems to be an inan. pl. It should be *wishagunuk*. Note Mrs Fielding's monstrous combination *weeshawgunsh wõnnûxâg* hairy whiteman. Cf. N. *uweshaganu*.

NE WEESHKERNUM I make a bed (*ně-wi'shkûnûm*). This is partly connected with N. *kukenaume* he puts in order, i. e. *kumu* = the last part of *weeshkernum*. The *weesh* may be for *wuleesh* good, well. In Abn. *walitebahlômuk* one arranges.

WEEWACHERMUNCH corn (*wîwâ'chēmûnch*) = N. *weatchimin*; Stiles *wewautchimins*. The *-sh* in this word is the inan. pl.

WEGATUH it is done (*wi'gâtû*). No cognate.

WEGOO it is clear (*wîgû*) = Abn. *uligo*.

WEGUN good (*wîgûn*) = Abn. *uligun*; RW. *wunnêgan*; D. *wuli*; Pass. *uli*, etc. *Wegun dupkwoh* 'good-night' is an undoubted Anglicism.

WEGUN TAH good day (*wîgûn tã*). *Tah* is probably an Eng. loan-word from 'day.'

WEJEESH his hand (*wîjî'sh*) = RW. *wunnuntch* his hand; Abn. *melji* hand.

WEMOO light, not dark (*wi'mû*). Has this anything to do with *wemooni*?

WEMOONI it is true (*wîmûnâi*) = N. *wonnomwan* he speaks the truth; Abn. *wawidwogan* truth; Del. *wulamoc* he speaks truly. Mrs. F.'s form should be *wenoomi*.

WENAI old woman (*wînâi*) = Stiles *wenyghe*; Abn. *winasosis*.

WEIOUS meat (*wi'ûs*) = N. *weyaus*; Abn. *wiûs*; D. *ojos*.

WEIOUSIBOIGE soup (*wi'ûsibõ'ij*). Cf. N. *sobaheg* porridge, from *saupæ* soft. See BOIGE.

NE WESUCK CHAWSUN this bed is hard (*nî wî'sûk chã'sûn*). Does the D. *gechgauwîwink* contain the root of *wesuck*?

NE WESUKWON I hurt myself (*ně-wisõgwõn*) = N. *woskheau* he hurts him; *nurwoskhit* I am hurt; D. *wissachgissi* it hurts me.

WETUN wind (*wi'tûn*) = Stiles *wuttun*; Oj. *notine*; Old Algonquian *lootin* (Lahontan).

WEYON tongue (*wi'yûn*) = N. *menan*; *wenan* his tongue; D. (Heckewelder) *wilanu*; Abn. *wilalo* his tongue.

WEYONGOO yesterday (*wiyûngû'*) = Abn. *ulôgua*; N. *wunnonkw*. D. *ulaque*.

WEYOUN moon (*wiyûn*) = Stiles *weyhan*, a pure Pequot word.

WEYOUT fire (*wi'yû't*) = Stiles *yewt*; RW. *yoteg*, loc.; Pass. *skwut*, Abn. *skweda*, Oj. *ishkote*. The N. wood is *nut* from the same stem.

WEZERWONG his name (*wi'zêwông*) = Abn. *wizowongan*; *kdeliwizi* you are named; N. and RW. *wesuonk*. See *Am. Anth.*, v, 209.

WHEE wheat (*hwi*). Eng. loanword.

NE WHEEZIG I am afraid (*nê-wi'zîg*) = RW. *wesassu* he is afraid.

WICHENAH when rel. (*wîchi'nă*). Same stem as Abn. *chiga*; D. *tsching* when?

WĪGWŌ'MŪN come in the house. A Brothertown word. A deriv. from *wigwom* house.

WISHBIUM get out, avaunt! (*wishbâ'ûm*) = partly from RW. *sawhush*; C. *sohhash*; Abn. *saosa* go out.

WOCHI from (*wûchâ'î*) = Abn. *uji*; RW. *wuche*; N. *wutche*; Moh. *ocheh*.

WODGIANUM he has (*wăjî'ă'nûm*) = Abn. *wajônem*. Cf. RW. *num-mache* I have.

WOGGEY for so that (*wô'gî*) = Abn. *waji*; N. *wutche* also *yeu wajeh* for this.

NE WOHTER I know (*nê-wă'tû*) = N. *waheau* he knows; Abn. *n'wa-wawinôwô*; RW. *nowantum* I understand. D. *nawa* = he knows.

WOMBAYOH white (*wômbâ'îô*) = Abn. *wômbi*; Pass. *wâbi*; N. *wompi*, Stiles *wumbiow*; Long Island *wampayo*; D. *wape*.

WOMBEOH he is coming (*wômbî'yô*) = *wu* + *bîyo* = N. *peyau*. See BEYOR.

WOMME all (*wâmî*) = D. *wame*; RW. *wameteâgun* all things; N. *wame*. See WONJUG.

WOMPSHAUK geese (*wă'mpshâ'k*) = Abn. *wôbtegua* the white goose; C. *wompohluck*.

WONJUG all people (*wô'njûg*), pl. of *womme*, q. v. See *Am. Anth.*, v, 207.

WONNUX white man (pl. -*ug*) = Stiles *waunnuxuk* Englishmen. This word is a derivative from *howan* = Peq. *orwon*, q. v., 'someone.' Cf. in Abenaki *awanooh* 'a Canadian Frenchman,' originally simply 'someone coming from yonder,' i. e. *awani uji*.

WONSARTAR Wednesday (*wō'nsātū'*). Eng. loanword.

WOODQUNCH wood for the fire (*wū'dkwūnch*) = N. *wuttuhqun*; RW. *wuttuckquanash* put wood on the fire.

WOOPERWAS a fly (*wū'gūwās* and *wū'jūwās*) = N. *uchaus*; Abn. *ujawas*; D. *utscheuwes*.

WOOSGEWE book (*wū'shgwig*) = N. *wussukwhonk*, from *wussukhum* he writes.

WOOSTOH he made (*wū'stū*). This is simply the same as Abn. *uji-to* he makes it out of something. See WOCHI.

WOOT mouth (*wū't*) = N. *muttoon*; Stiles *cuttoneage*; Abn. *mlon*; D. *wdon* his mouth.

WOOTHUPPEAG pail, bucket (*wū'tūpī'g*). No cognate.

WORMUNCH eggs, inan. pl. (*wā'mūnsh*) = N. *woanash*; C. *wouwanash*; Abn. *wōwanal*; D. *wahh*.

WORWHODDERWORK they shout (*wā'wōdūwā'k*). No cognate.

WŌTĪ'NĒ help; cf. *nēwōtī'nēmōng* he helps me = N. *kuttannumous* I help you. In Pequot the forms *nēwōtī'nēmōwū* 'I help him,' and *wōtī'nēmōwū* he helps him, occur; see *Am. Anth.*, v, 204.

WOTOHEESH it is his (*wōtōhī'sh*) = *wo + t + o + sh*, inan. pl. = N. *wuttaihe* as in *nen-wuttaiheuh* I am his.

WOTONE go to a place (*wōtōnī*) = D. *aan*; N. *au*.

NER-WOTSHOR I went (*nē-wō'tshā*). This must mean 'I went from.' See WOCHI.

WOUMBUNSEYON if I live in the morning (*wōmbūnsiyōñ*) = Abn. *wōban* + Peq. *seyon* if I am.

WUNX fox (*wūnks*) = Stiles *awaumps*; N. *wonkqussis*; Abn. *wōkwes*.

WUSGWOSU he writes (*wū'skūsū'*) = N. *wussukhon* he writes; RW. *wussuckhosu* he is painted. See WOOSGEWE.

WŪSKŪSŪ' 'writing'; noun.

WUTUGAPA it is wet (*w'tūgāpā'*) = N. *wuttogki* it is wet; Stiles *wut-tugw* it is wet; Abn. *udagkisgad* wet weather. I think this *w'tugapa* means 'it would be' (*-pa* = Abn. *-ba* would be; suffix of the conditional).

WUTUGAYOW it is wet (*w'tūgāyō*).

WYCOJOMUNK O dear me (*wāikūjō'mūnk*). No cognate.

YEOWDI here (*yū'dā'i*) = Abn. *yu dali*; N. *yeut*, with loc. *ut*.

YERTUM he thinks, a thought (*yū' tūm*). Cf. TIATUM. This word is probably cognate with the stem seen in N. *anantum*; Abn. *laldamen* he thinks it, i. e. *yū'tumantum*, *aldam* to be in a state of mind. See p. 16 on *l-n-r*.

YOKEG parched corn (*yôkig*) = N. *nuhkik*; RW. *nokehick* Indian corn parched and beaten.

YONOKWASU sewing (*yô'nâkwâsû'*) = N. *usquontosu* he is sewing.

YOTS rat (*yôts*). Eng. loanword.

YOU this (*yû*) = Abn. *yu*; N. and RW. *yeu*. Cf. Pequot *you dupkwoh* this night; *you geesk* today.

YOUMBEWE early morning (*yûmbô'wî*) = *yu* + *mbi* or *inbi* + *wi*. The root is seen in N. *mautompan*; RW. *mautabon* 'early morning' and the ending *-wi* appears in Abn., e. g. *spôzowîwî* 'early in the morning.'

YOUMBEWONG again (*yû'mbêwong*) = *yu* + *inbi* + *wong* = N. *wonk*; D. *woak* 'and' 'repetition.' See *Am. Anth.*, v, 208. *Inbi* or *mbi* may mean 'time.'

YOW four (*yâ'û*) = Abn. *iaw*; N. *yau*; Stiles *yauuh*.

YUKCHAWWE yonder (*yû'kchâwî'*) = N. *yô, ya* yonder. Perhaps the first part of the word is cognate with D. *ika* yonder.

YUNDUM he is hungry; *gëyôndûm* you are hungry. See PIAUTUM.

YUNJANUNPSH open, inv. (*yû'njânû'msh*). Is this cogn. with N. *woshwunnum* *sqount* open the door? This *yunjum* probably = Abn. *tondana* open, inv., D. *tenktschechen tonquihillen* open. In Peq. *yunjon* = he opens; subjunctive *yunjonum* that he open, not really a subjunctive.

ZEESHKUNUS milk (*zî'shkûnûs*), a difficult word. Stiles gives *nuzaus* a baby, a sucker. This *-zaus* may be cogn. with *zeesh* here? Perhaps the word should be *nuzeeshkunus* with prefixed *n*? There is no D. cogn. for milk; they say *mellik*. In N. milk = *sogkôdtunk*, from *sogkôdtungash* teats.

ZEEWOMBAYOH blue (*zî'wômbâ'îô*). In N. *see* = unripe. *Zeewombayoh* may mean 'an unripe white'? I can find no parallel.

NE ZERMUKSUN I lie down (*nëzûmû'ksûn*). Cogn. with N. *summa'-gunum* he stretches out.

ZOB tomorrow (*zâb*) = N. *saup*; RW. *sauop*; Abn. *saba*; Pass. *sepaunu*.

ZOOGERYON rain, it rains (*zû'gûyûn*) = Abn. *soglon*, from *sognem* he pours. Cf. N. *sokanon*; RW. *sokenum* it pours forth; D. *sokelan* rain.

ZOTORTAR Saturday (*zâ'tâtâ*). Eng. loanword.

ZUNATAR Sunday (*zû'nâtâ*). Eng. loanword.

ZUNGWATUM anything cold (*zûngwâ'tûm*), lit. 'it is cold.' See TEKIYO. Cf. N. *sonqui* it is cold; RW. *saunkopaugot* cold water. The same stem is seen in Abn. *wesguinôgana mzena* he has a cold with a cough.

COUNTING-OUT RHYMES OF CHILDREN

By WILL SEYMOUR MONROE

In the belief that the reactions of children on their play interests would be of service to the student of the psychology of childhood, I instituted five years ago the following investigation among the pupils in the elementary schools of western Massachusetts.

Two sets of compositions were written by two thousand and fifty (2,050) children, the direct aim of the investigation being six-fold :

1. To make as complete as possible a list of the traditional games of Massachusetts school children.
2. To determine the play interest of children as indicated by their preference for certain games.
3. To obtain descriptions of traditional games.
4. To ascertain personal variations in such typical games as tag and hide-and-seek.
5. To ascertain the qualities involved in determining leadership in plays and games.
6. To determine the extent and importance attached to counting-out rhymes in the plays and games of school children.

I now desire to present a brief review of the results obtained on the sixth and last rubric of the investigation. The compositions were written in the schools as a part of the required school work and the papers sent to me. The results were collated, tabulated, and curved by sexes and ages. The ages of the children were from 7 to 16 years, 978 of the whole number being boys and 1,072 girls. Of the more than two thousand children tested but five boys reported that they never used counting-out rhymes in their games. One of these was further questioned by his teacher as to the method employed in determining who shall be "it," and he replied : "I say to the boys, let's play. I'll be 'it' to begin the game."

The incident is introduced not because of surprise that these lads knew no counting-out rhymes, or at any rate made no use of

such rhymes, but because the investigation suggests that such rhymes are apparently universal features of the plays and games of children. Indeed, individual children reported as many as seventeen (17) such formulas.

In all, one hundred and eighty-three (183) different counting-out rhymes were reported, but all but fifty-four (54) proved to be variations of a few pleasing or much used jingles. The girls throughout mentioned more such rhymes than the boys. The one oftenest named, being given by 91 percent of the children, is the unmeaning and inelegant :

*Ena, mena, mina, mo,
Catch a nigger by the toe ;
If he hollers, let him go,
Ena, mena, mina, mo.*

The second in point of popularity, being given by 86 percent of the children, is :

*One, two, three, four, five, six, seven,
All good children go to heaven.*

And the third oftenest named (given by 79 percent of the children) is :

*Richman, poorman, beggarman, thief,
Lawyer, doctor, merchant, chief.*

Sex differences were pronounced in the study. Rhymes involving color and dress were mentioned much oftener by the girls than by the boys, such as :

*Red, white and blue,
All out but you.*

And

*As I went up the steeple,
I met a crowd of people ;
Some were white and some were black,
And some were the color of a ginger-snap.*

The same is true of counting-out rhymes which involve love, courtship, and marriage, such as :

He loves me, he loves me not,

being mentioned almost exclusively by girls.

Boys, on the other hand, are far ahead of the girls in counting-out rhymes which involve number combinations, such as :

*Little boy driving cattle,
Don't you hear his money rattle,
One, two, three, out goes he.*

and

*Intry, mintry, coutry corn,
Apple seed and apple thorn ;
Wire, briar, limber, lock,
Three geese in a flock ;
One flew east, one flew west,
One flew o'er the cuckoo's nest,
One, two, three, out goes he.*

Boys also lead in rhymes involving animals and natural phenomena, such as :

*As I was walking near Silver lake,
I met a little rattlesnake ;
He ate so much of jelly cake,
It made his little belly ache.*

Nursery rhymes and jingles are made to do service in the plays and games of children, as is apparent from the frequent mention of such counting-out rhymes as :

*Hickory, hickory, dock,
The mouse ran up the clock,
The clock struck one and down he ran
Hickory, hickory, dock.*

Also :

*Peter, Peter, pumpkin eat her,
Had a wife and couldn't keep her.
Put her in a pumpkin shell,
And there he kept her very well.*

Many of the older children were questioned as to whether they ever composed, or had known of their companions composing counting-out rhymes for their plays and games, but none such could be recalled. From the large number of variations, however, it is apparent that children must add to and alter such rhymes. Following are examples of such variations :

*As I went up the apple tree,
All the apples fell on me ;
Bake a pudding, bake a pie,
Did you ever tell a lie ?
No, but I stole my mother's tea-pot lid.
She kicked me up, she kicked me down,
She kicked me all around the town.*

Compare with the following :

*As I went up the apple tree,
All the apples fell on me ;
Bake a pudding, bake a pie,
Did you ever tell a lie ?
No, I never told a lie,
But I ate the apple pie.*

These unmeaning and mysterious formulas, according to the testimony of the children themselves, serve a two-fold purpose in the play-activities of childhood :

1. They determine who shall take the undesirable part in a game — a species of casting lots, as has been suggested, but differing in the method of execution. As these Massachusetts children say, the counting-out rhymes enable them to determine who shall be "it" — the use of "it" being purely technical and having distinct meaning in their play-vocabularies, — and

2. They use these rhymes for purposes of divination ; some of them foretell the life-duration of the child ; others the occupation of prospective husbands, probable number of children, etc. Bolton is doubtless right in regarding counting-out rhymes as survivals of the practice of sorcery — spoken charms originally used to enforce

priestly power — and now repeated by children in innocent ignorance of the practices and language of a sorcerer in some dark age of the past.

Although occasionally undergoing changes, being transmitted from one generation of childhood to another through oral repetition, the marvel is that they should survive at all with such apparent purity. This persistence is possible only through a conservatism of children which is as pronounced as it is unexpected, since in most of the matters that concern them, they are reformers of the most aggressive type — wholly oblivious of the traditions and limitations of their environment.

But in all that pertains to their play interests, they are conservative to the core. The formulas of play are clung to with gospel tenacity ; and children themselves are most displeased when the canons of games have been violated.

Because of this insistence, this vein of juvenile conservatism, children's play interests and activities, with their counting-out rhymes, are the oldest things in the world, linking the child through his play-life to the mental life of savages and barbarians.

NOTES ON THE INDIANS OF SONORA, MEXICO¹

By ALEŠ HRDLIČKA

INTRODUCTION

My field-work in physical anthropology in 1902 included a visit to several of the scientifically important but little-known tribes of Sonora. This paper, the result of the visit, embodies the casual observations made, together with whatever reliable information I was able to gather, on the present state of these Indians, to which are added some preliminary notes on their physical characters. I shall not be able to present many entirely new data concerning the ethnology of the tribes of this region, because my visit was short and also because much of the purely Indian has become obscured; the object of the paper is more to direct the attention of students to this field of research than to cover the same.

For historical information concerning the Sonora tribes the reader is referred especially to the writings of Ribas, Ortega, Zapata, and other Jesuits, and particularly to the anonymous *Rudo Ensayo*;² while more recent notes of value will be found in the works of Hardy, Velasco, Bartlett, Stone, Corral, Bandelier, McGee, and Hernandez.³

¹ Based on researches conducted for the Hyde Expedition under the auspices of the American Museum of Natural History, New York City, and published by permission of the Museum. All the illustrations are from negatives by the author, now the property of the American Museum.

² Andrés Perez de Ribas, *Historia de los triumphos de nvestra Santa Fee*, Madrid, 1645. [José Ortega,] *Apostólicos afanes*, Barcelona, 1754. Ortega, *Historia del Nayarit, Sonora, Sinaloa y ambas Californias*, Mexico, 1887 (same as his *Apostólicos afanes*). Juan O. Zapata, *Relacion de las Misiones de la Nueva Viscaya*, 1678 (in N. Viscaya, Doc. Hist., tomo III, also MS.). The anonymous *Rudo Ensayo*, San Augustin de la Florida, 1863; also translation into English by E. Guitéras, *Records of the American Catholic Historical Society of Philadelphia*, vol. v, no. 2, 1894.

³ R. W. H. Hardy, *Travels in the Interior of Mexico*, London, 1829. Ignacio Zúñiga, *Rápida ojeada al estado de Sonora*, Mexico, 1835. J. A. de Escudero, *Noticias estadísticas de Sonora y Sinaloa*, Mexico, 1849. J. F. Velasco, *Noticias estadísticas de Sonora*, Mexico, 1850 (also in English). John Russell Bartlett, *Personal Narrative*, N. Y., 1854. Chas. P. Stone, *Notes on the State of Sonora*, Wash., 1861. Ramon

Another list of works, as well as an abstract of the historical references to Sonora and its indigenes, are given with noteworthy completeness in the works of H. H. Bancroft.¹

The territory now included in the state of Sonora was first penetrated by whites in 1533, when a party led by Diego de Guzman advanced from Sinaloa as far as the Rio Yaqui. Guzman was followed by Cabeza de Vaca (1536), Pedro Nadal and Juan de la Asuncion (1538), Marcos de Niza (1539), Coronado (1540), and Ibarra (1564 or 1565);² after these, early in the seventeenth century, came the main body of the friars, among whom (1604-20; in Sonora 1617-20) was the historian Ribas. From the narratives of these pioneer explorers or their companions it is learned that Sonora in the sixteenth century was inhabited by several populous and a number of minor tribes and divisions of natives. Some idea of the number of the Indians soon after the discovery can be gained from the assertion that in 1621 the converts of Sonora and Sinaloa alone numbered 86,340, and in 1624 they were estimated at over 100,000.³

The various tribes, as distinguished by different languages, and apparently many parts of tribes, were referred to by the early Spaniards under distinct names, usually those of their settlements. For example, it is recorded that Diego de Guzman reached a village called Yaquimi,⁴ and the name, in the form of "Yaqui," was extended to the river flowing by the village, to the people of the

Corral, *Razas indigenas del estado de Sonora*, 1884. A. F. Bandelier, *Final Report*, Arch. Inst. Am., Papers, pt. II, Cambridge, 1892. W. J. McGee, *The Seri Indians*, 17th Rep. Bur. Am. Ethnology, Wash., 1898. Fortunato Hernandez, *Las Razas Indigenas de Sonora y la Guerra del Yaqui*, Mexico, 1902. A. Hrdlička, *Report on a Seri Skull and Skeleton* (included in McGee's and Hernandez' publications here mentioned).

¹ *Native Races of the Pacific States*, vol. I, 1874, p. 571 et seq.; also *North Mexican States and Texas*, vol. I, 1884, and vol. II, 1889.

² It is possible that some portions of the Cortés expedition (1532), particularly that of Hurtado de Mendoza, came in contact with the Sonora Indians even earlier than Diego de Guzman. Some authors, including Escudero, mention Pedro Almenes Chirinos as the first to reach the Rio Yaqui, in 1533, but this is considered by Bancroft (*North Mexican States*, I, 54-55) to be an error.

³ Bancroft, *North Mexican States*, I, 226-27, from original sources.

⁴ See Bancroft, *op. cit.*, I, 57; also map p. 43; original statement in Diego de Guzman's Relation (quoted in Bancroft, p. 56). For another account of the name Yaqui, or Hiaqui, see Ribas, *Historia*, *op. cit.*

village, and to their congeners along the river. Such was the case also with the Nevomi or Nevome, and Nuri, farther up the stream, and subsequently in many localities to the northward; indeed there is no historical evidence that any of the numerous names applied to tribes, found in early records of Sonora, were those used as tribal names by the Indians before the advent of the whites.

THE TRIBES IN GENERAL

The principal peoples early found in Sonora were, to use their historical names, the Mayos, Yaquis, Opatas; Heris, Ceris or Seris; Pimas, Papagos, some Yumas and possibly Coco- or Co-Maricopas; also the much later noticed and probably not truly indigenous Apache. There were likewise the Nevomes, apparently a separate band of either the Pimas or Yaquis; the Eudeves, Sahuaripas, etc., various divisions of the Opatas; the Jovas, who were, it seems, different in origin from the Opatas;¹ the Tepocas or Tepopas, Sobas and probably Guaymas,² who were parts of the Seris; etc. The Pimas were divided into the "Bajos" and "Altos" (Lower and Upper), and probably included the Corazones, Nuris, and others.³

All the above tribes (except the Apaches, who, being mainly an extraneous people, will not be further considered herein) are shown to be sedentary, for their descendants to this day preserve the same general geographical distribution as in ancient times. (Plate III.)

Most of the smaller divisions have disappeared as such, having doubtless become blended with the parent or main stock; the remaining distinct tribal groups in Sonora are the Mayos, Yaquis, Pimas Bajos, Opatas, Seris, and Papagos.

¹ "The Eudebes and the Jovas may be counted with the Opatas; the former, because their language is as little different from the Opata as the Portuguese is from the Castilian, . . . and the latter, because they live among the Opatas, and for the most part speak their language, with the exception of some women and old men, who retain their own language, which is a very difficult one and different from all the others spoken in the Province."—*Rudo Ensayo*, p. 70 orig., p. 166 transl. "The Jovas are ruder and more awkward and less tractable than the Opatas, and prefer to live not in villages but on ranches in the mountain ravines."—*Ibid.*, pp. 98–99 orig., pp. 186–87 transl.

² "The Guaimas speak the same language, with but little difference, as the Seris."—*Rudo Ensayo*, p. 70 orig., p. 166 transl.

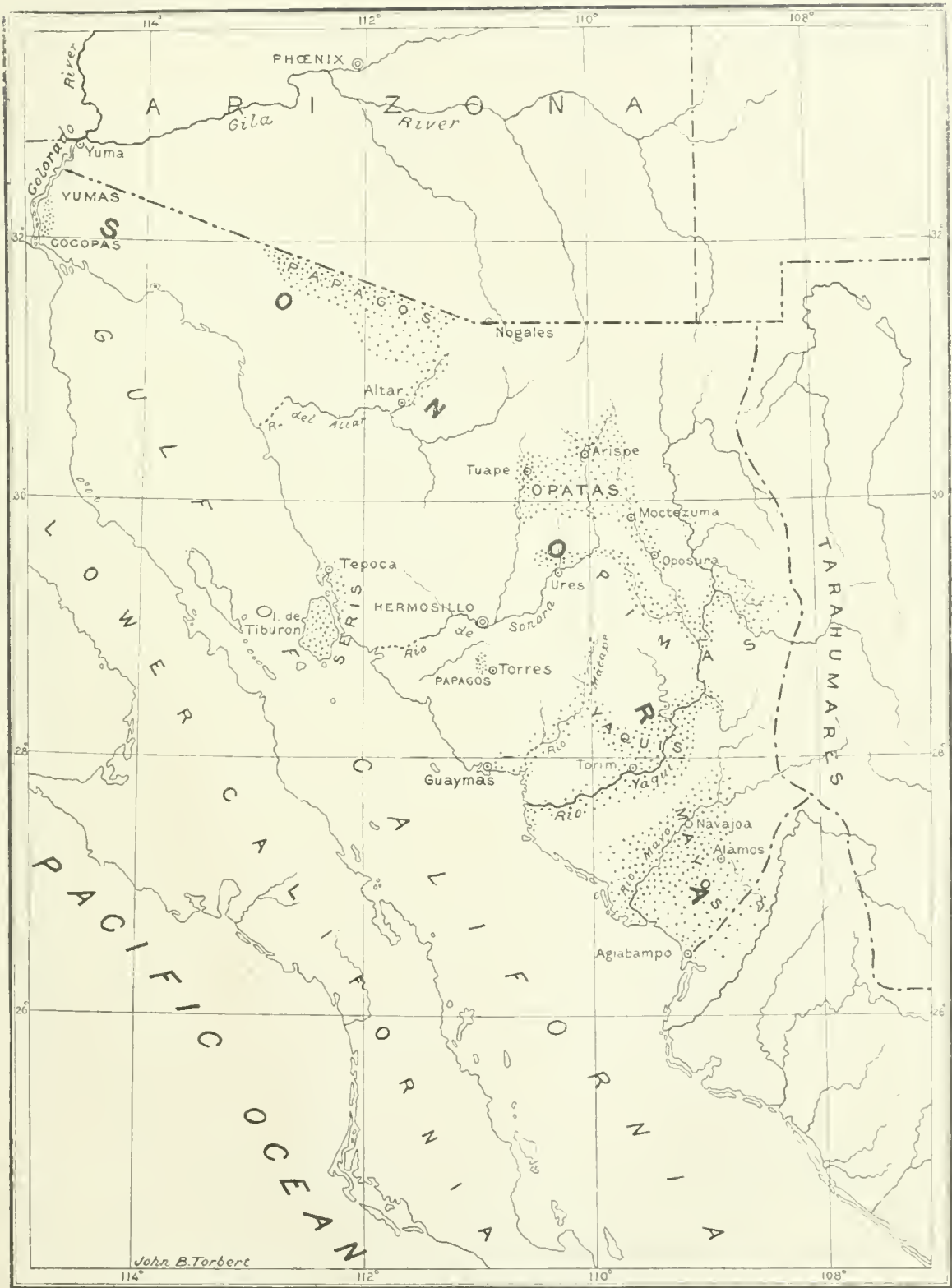
³ See identification of the Corazones village with Ures by F. W. Hodge in *Memoirs of Explorations in the Basin of the Mississippi*, II, "Harahey," St. Paul, Minn., 1899.

Habitat. — The Mayos occupy practically the same region as they did in the sixteenth century — the lower part of the Mayo valley and much of ancient Ostimuri. The Yaquis, until a comparatively recent date, remained centered along the lower Rio Yaqui, but they are now scattered over the larger part of southern Sonora. The Pimas Bajos still live along a part of the upper Yaqui, as well as in certain localities about Ures (*e. g.*, Pueblo Viejo) and in the district of Magdalena. The remnants of the Opatas are found principally along San Miguel river, but they are also met with in many spots farther west, over their ancient territory. The Seris proper are restricted, as ever, to Tiburon island; but there remain also, on the mainland, a few Tepocas. The Papagos, since Sonora was reduced to its present boundaries, have become in large part a tribe of Arizona, but a fair number still live south of the Arizona line, in the district of Altar, reaching individually as far as the town of Altar, while a small group is settled a little west of Torres, south of Hermosillo. The Pimas Altos and Maricopas have nearly disappeared from Sonora, owing mainly to their assignment to reservations in the United States. In the northwestern corner of the state, according to information given me by some Yumas and recently confirmed by Mr J. S. Spears, superintendent of the Fort Yuma Indian school, there are a few Cocopa Indians on the Sonora side of the Rio Colorado, and about fifty Yumas are found about the boundary line. It is quite probable that a few Tarahumares also are settled near the southwestern boundary of Sonora, but on this point I have no positive information.

Population. — As to the relative numbers of the Sonora Indians, it was estimated by the padres in 1621 that there were 21,000 Mayos (30,000 according to Ribas), 30,000 Yaquis, and 9000 Nevomes. Zapata, in the latter part of the seventeenth century, reported the population of the seven main Yaqui pueblos as 8116; while in 1760, according to Jesuit accounts, the population of eight principal settlements of this tribe was 19,325.¹ In 1849, according to Escudero² (who is not so explicit in regard to other tribes), the

¹ See Bancroft, *North Mexican States*, I, 245-247, 572 et seq.

² *Noticias estadísticas de Sonora y Sinaloa*, p. 100.



MAP SHOWING THE PRESENT DISTRIBUTION OF THE INDIANS OF SONORA, MEXICO

eight chief pueblos of the Yaquis contained from 54,000 to 57,000 natives and somewhat more than 200 *gente de rason*, or whites.¹ This particular estimate doubtless included the inhabitants of the entire territory belonging to the pueblos named, but even if so considered it appears to be an exaggeration.

The Opatas extended from the western branch of the Rio Sonora to the Sierra Madre, and, though scattered, must have been numerous. A Jesuit census of 1730² gives their number, including the Eudeves and Jovas, at nearly 7000; Hardy³ in 1829 estimated them at about 10,000.

Taken together the Pimas were also undoubtedly a populous tribe, extending over an irregular and possibly interrupted area from the region northeast of the Yaquis to the Gila. According to the Jesuit census above cited, their number in 1730 was 4378, but this can not have included the entire tribe.

Of the Papago population nothing is definitely known, but the tribe was large enough to make itself felt in several conflicts with the whites, particularly in that of 1840.

The Seris, including the mainland branch, numbered, at various periods prior to 1884, from 1500 to possibly 4000.⁴

As to the present numbers of these native tribes even approximate estimates can be given only with difficulty, since there are no reliable statistics concerning the natives in the state or country. Owing partly to constitutional peculiarities and partly to apathy, no thorough census has ever been attempted. There are, however, in Sonora, and indeed throughout Mexico, practically insurmountable obstacles to an ethnically correct census owing to the great intermixture of the various elements of population, combined with the character of some of the natives and the almost inaccessibility of a large part of the country. From what can be seen and learned

¹ Cocori, 4000 natives; 150 whites. Bacum, 4000 to 5000 natives. Torin, 10,000 to 12,000 natives; 6 families of whites. Bicom, 9000 natives; 3 families of whites. Potam, 8000 natives; 4 families of whites. Racum, 6000 natives; 2 families of whites. Quiriribis, 10,000 natives; 4 or 5 families of whites. Belem, 3000 natives.

² Reproduced in Bancroft, *North Mexican States*, 1, 513-514.

³ Op. cit., p. 437.

⁴ The various estimates by Velasco, Troncoso, Retis, Hardy, De Mofras, and others are summarized by McGee, op. cit., p. 135. A reference to some additional reports on Sonora population will be found in Escudero, *Noticias estadísticas*, p. 83.

from reliable sources it would appear that both the Mayos and the Yaquis are nearly, if not fully, holding their own in point of numbers. Indeed little has occurred within the last half century that could materially affect the population of the Mayos; the Yaquis, however, since 1849 have lost many hundreds of men and even numerous women and children during their frequent rebellions, while others have been removed from Sonora to less healthful regions and have died in captivity. Yet during this period there remained many hundreds of healthy and prolific Yaqui families on Mexican haciendas, in or near Mexican towns, near mines, and in mountains, probably increasing sufficiently to equalize the loss. It is not possible to give reliable figures, but wherever one turns in southern Sonora he meets with pure-blood Yaquis, and sometimes they may be encountered in almost any part of the state, as well as beyond its borders. Stone, in 1860, estimated the Mayos at 10,000 to 12,000, and the Yaquis at about 20,000 persons. Conservative local estimates today give the Mayos a number nearly twice as large, while for the Yaquis the estimate for 1860 would probably serve very well for the present time.

The Pimas (particularly those in the Magdalena district and about Ures), and especially the Opatas, are nearing complete assimilation with the whites. Owing to the Yaqui revolution of 1902, I was not able to reach Tonichi, Soyopa, or other Pima settlements northeast of the Yaquis, hence can give no information as to their numbers in those parts; but about Ures the Pimas are reduced to not more than 200 or 300, and these are scarcely distinguishable among the general population.

Of the Opatas the pure-bloods today can barely reach 500 or 600. In such settlements as Opodepe, Arizpe, and others, where even a century ago the Indians of this tribe numbered hundreds, it is now difficult to find a dozen pure-blood individuals.

The Seris, according to McGee,¹ now number about 300 and are probably slowly increasing. I regret that with the means available I was not able to enlist a suitable party with which to visit the tribe, and therefore can give nothing respecting its numbers from my own observation.

¹Op. cit., p. 135 et seq.

Civilization. — The Mayos, Yaquis, Pimas, and Opatas were among the earliest tribes of northern Mexico to receive missionary friars, and, consequently, the Catholic religion as well as some civilization. But with the limited possibilities of the padres, in the face of the deep-seated primitive religion and superstitions of the natives, coupled with the bad example of the white colonists and especially with the various conflicts that arose, real civilization of most of those who were not actually absorbed by the whites remained little more than nominal. The Opatas alone largely adopted the mode of life and organization of the whites and recognized their laws. The other three tribes accepted the dress and ultimately (but without relinquishing their own) the language of the whites; they also, probably as a reflection of their original traits, always respected, in some degree at least, their treaties, and when in conflict did not commit great atrocities. Excepting the Yaquis, they recognized the general law and authority of the government. For a long time, however, they adhered to and in many localities they still preserve their native practices. The tribes that were brought less in contact with the whites, such as some of the Papagos and particularly the Tiburon Seris, have firmly resisted, wherever possible, all change in their old condition.

At present the Opatas, Yaquis, Mayos, the Ures Pimas, and some of the Papagos are, with a few minor exceptions, in about the same culture-grade as the lower classes of white and mixed Mexicans. Most of the Papagos live in their own villages or rancherias about the frontier, and preserve their customs and traditions in almost aboriginal purity. The Tiburon Seris, as McGee has shown, remain entirely in a primitive state. The Opatas alone have reached such a stage that for the greater part they not only dislike to be called Indians, but (at least along the Rio San Miguel), even endeavor not to use their own language or anything else that distinguishes them from their neighbors. They preserve, however, a few of their old ceremonies or dances. They send their children to school when convenient, and in some localities, as at Tuape, are permitted to vote. The Yaquis, Mayos, and Pimas of Yaqui river still prefer their own tongue, but almost all of them know more or less of the Spanish. The members of these tribes who have received

some education are distinguishable from the whites only by their color and features. The members of these tribes generally prefer to live more or less together, in dwellings of their own; this is not alone from the desire not to associate with the whites, but also because they have been so long accustomed to their light, well-ventilated huts, which are more healthful and comfortable than the adobe houses of the Mexicans.

There is no doubt, from all that one sees today, that if really good schools, with industrial training, were provided for all the children of the Sonora tribes, barring the Seris, in two or three generations the state would be the home of only civilized Indians, and, judging from some examples, even the Seris are not a hopeless task by any means. The physical and intellectual qualities of the Sonora native stock are high; indeed they are such that the state, notwithstanding its disastrous past, has brighter prospects than almost any other in the Mexican federation.

Archæological. — Before taking up the Sonora tribes in detail, a few words may be said about traces of prehistoric occupancy of the region. On the north the territory adjoins Arizona, in the central and northern parts of which ruin sline most every stream and extend into the valleys and plains. In Sonora, however, while in the northern and western parts remnants of old villages, artificially terraced farming strips, and simple fortified hills occur,¹ nowhere are there pueblo structures corresponding to those of Arizona. I have neither seen nor heard of a single ancient ruin along the lower Yaqui or to the south of it, and none to the south or west of Ures — a dearth which signifies the prevalence of more or less perishable dwellings ever since the aboriginal occupancy of the region began.

The early explorers saw only dwellings made from brush and poles and palm leaves or mats (*petates*), and such may be seen among the Sonora natives almost everywhere today. The Opatas

¹ For a detailed account of such structures see Bandelier, *Final Report*, p. 482 et seq. There are two fortified mountains a short distance from Tuape. Dr Alderman, who visited one of these, found some remnants of well-laid walls and considerable broken pottery and metates. Similar hills are spoken of in other parts of the Opatá region. Batres, in his *Cuadro arqueológico y etnográfico de la República Mexicana* (Mexico, 1885), mentions “ruinas de edificios conocidas con el nombre de S. Miguel de Babiacori,” and “grutas de Sahuaripa.”

alone, as they well remember, built stone foundations or walls to their habitations, which may account for the remnants now found in their country. A thorough survey of the state would probably bring to notice many more traces of archeological interest than are now known, but that any larger type of ruin exists in Sonora is very doubtful.

THE TRIBES IN DETAIL

THE MAYOS

The Mayos¹ form today the second largest, if not the largest, tribe of Sonora. They have been settled, since known to history, in the southern part of the state, principally along the lower Rio Mayo and extending nearly to the Yaqui on the north and the Fuerte on the south. Their principal settlements at the present time are Macoyahui, Conicari, Camoa, Tecia, Navojoa, Cuirimpo (or San Ignacio), San Pedro, Echojoa, Huatabampo, and Bacabachi, all of which, except Macoyahui and Conicari, are situated south of and near the Rio Mayo. Their population, including the dependencies, is locally estimated at about 20,000. There are many scattered Mayos on haciendas and elsewhere to within less than forty miles of the Rio Yaqui, as well as along the Fuerte and toward Sinaloa. One or two localities, the names of which terminate with the characteristic Mayo *bampo*, are found even north of the Rio Yaqui.²

A large majority of the people are still of pure blood (pl. iv, 1, 2, 4); but in San Pedro, Echojoa, and Huatabampo there are some of much lighter complexion and eyes, very probably the result of foreign admixture. A greater or less degree of mixture with Mexicans is quite general and is increasing.

The Mayos use the same language ("Cahita") and exhibit the same general degree of culture as the Yaquis; but the two tribes, contrary to general belief, show certain ethnological differences and are not identical physically. The primitive Mayo culture, of which only traces can now be seen, was apparently of different origin. The Yaquis, through conquest, regarded these people as their vassals and

¹ I take this opportunity to express grateful acknowledgment, for much aid in my work among the Mayos, to Señor Don Jesus Velderrain, of Guadalupe, Sonora, one of the most cultured men in the region.

² See strategic map in Hernandez, op. cit.

exacted tribute from them as late as the latter part of the nineteenth century, during the domination of Cajéme. During the last century the two tribes were occasionally allied in warfare, but always at the instance of the Yaquis.¹ No insurrection against the whites has ever originated with the Mayos themselves.

The principal occupation of the Mayos is agriculture ; they also raise some cattle and engage in various industries ; but on the whole they do not seem to be so universally sturdy and habile as the Yaquis. Lately the government allotted the lands of the villages in severalty, giving the Mayos separate deeds, a transaction which places them in this particular on an equal footing with the Mexicans.

The native arts are apparently degenerating. The women formerly made beautiful woolen serapes, but now one such is rarely seen. The blanket now manufactured is mostly crude in quality and with little or no decoration. Some of the men wear a blue *huipil*, or sleeveless, one-piece chemise of native weave, which I saw nowhere else in Sonora. The women make also a few fine *fajas*, or belts, which display considerable skill and are characteristic in color and decoration, reminding one of the finer Scotch plaids.² Palm mats, hats, common baskets, and a little ordinary pottery practically complete the native manufactures, at least in the upper part of the Mayo country.

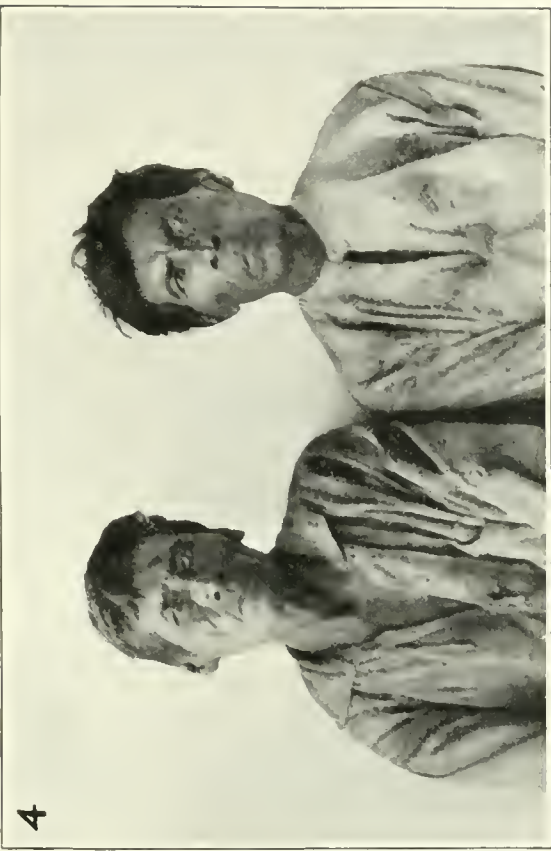
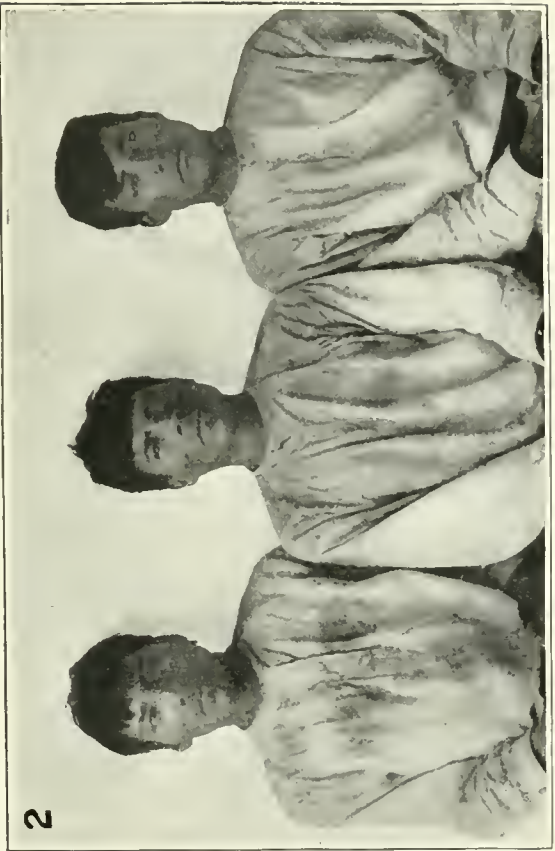
The Mayo dwelling consists mainly of a quadrangular hut, often with a partly open extension, with walls of brush, reeds, or adobe, and with flat or nearly flat roofs, all as among the Yaquis. (Plate VII, 3.)

The dress, with the exception of the occasional *huipil*, *faja*, *serape*, and hat, is of Mexican origin. As among all the Sonora Indians, the Seris excepted, the hair of the men is worn short ; that of the women is braided in a manner similar to that of the Mexicans.

There is no tribal organization, though the elders generally have much influence. The more important governing power is entirely Mexican in character, but many smaller offices are intrusted to the Mayos themselves.

¹ Consult notes on Bandera's revolution in Hardy's *Travels*, and the accounts of Sonora historians, *op. cit.*

² I obtained specimens of all grades of the blankets, as well as belts, which are now in the American Museum of Natural History.



MAYO AND OPATA TYPES
1, Mayo girls. 2, Mayo young men 3, Opata young women. 4, Mayo men.

Of native customs I can speak but little from actual observation. According to Señor Velderrain the Mayos are wholly converted to the Catholic faith and are often quite fanatical in exercising it. A remnant of an ancient custom consists of sacrifice in honor of their dead, "*para que vallan al cielo*" of sheep and cattle. There are certain men, called *maestros*, who are charged with curing the ill and of communicating with the dead. There are others who are resorted to for curing sickness alone, their treatment consisting of various incantations and of the use of certain herbs.

Alcoholism prevails among the Mayos, as among other Indians where the opportunity exists, but one rarely meets with a confirmed toper as among the whites. There is also manifest much love of feasting and ceremony, and a frequent want of providence, as among so many other tribes of Indians.

THE YAQUIS¹

The most interesting Sonora tribe, psychologically as well as physically, is that of the indomitable Yaquis. This is the only tribe on the continent that, surrounded by whites from the beginning of their history, have never been fully subdued, for they still intermittently carry on a fight for their lands and independence, as they conceive it, — a conflict which commenced with Guzman's invasion in 1533.² Some women and young men of the tribe are shown in plates v and vi.

An account of the long series of struggles, however interesting,

¹ In my investigations concerning this tribe I have received and gratefully acknowledge much valuable aid from Gen. Luis Torres ; from Sr. Don Rafael Izábal, Governor of Sonora ; and particularly from Sr. D. Francisco Muñoz, Secretary of the State of Sonora.

² Escudero (*Noticias estadísticas de Sonora y Sinaloa*, Mexico, 1849, pp. 137-38) wrote half a century ago : "The Yaqui nation has never been governed by the whites." The tribe "had its own governors and one principal *capitan*, who exercised a sovereign authority. Their authority has always been recognized by the judges and governors of Sonora. Neither have the Yaquis paid tribute ; they were permitted to cultivate the native tobacco, called *macuchi*, because it was impossible to introduce that of commerce or to destroy what has been sown ;" and, "the most surprising condition, culprits of all sorts were immune in their pueblos. A deserter or a criminal who escaped to the Yaquis was secure from apprehension by justice." The only apparent change effected since 1849 concerns the last-named privilege, of which no more is heard. But it is hard to see how any refugee once finding an asylum among the free Yaquis, could, even today, be retaken.

cannot be given here.¹ Notwithstanding their early conversion to the Catholic religion, and a fair degree of civilization, these Indians display a persistent insurgent spirit and general bitterness toward the Mexicans which lead again and again to organized outbreaks, resulting in serious losses. On the other hand the Mexicans of the lower class manifest an insatiable greed for the extremely fertile lands of the tribe, while the government, through its militia, wages a sometimes just but usually merciless warfare that spares neither sex nor age and which generally aims at the annihilation of what is the most virile element of the Sonora population. Occasionally there is a sort of truce, during which the Indians replenish their supply of ammunition and weapons, whereupon, if there be a leader (and the demand for such seems ever to be fitly met), the insurrection begins anew. And thus, the free Yaquis declare, when one can be induced to speak, it will be until the very last of them; and their history substantiates this determination. The friars have been accused, particularly recently, of fomenting the Yaqui wars for selfish interests; the charge may be true, but is difficult to prove.

Numbers. — From time to time the announcement is made that the Yaquis are becoming greatly reduced in numbers, and are even on the verge of extermination, but such statements are erroneous. As before mentioned, the pure-blood Yaquis alone still form one of the strongest tribes of Sonora. The current reports, including those of Mexican army officers, undoubtedly refer only to the Yaquis in the field, a contingent which varies according to season, opportunity, or other circumstance, and which occasionally, when the supplies are exhausted, or planting or harvest time approaches, disappears entirely. Fortunately for Sonora enterprise there is no prospect of the tribe at large becoming extinct, as has been pointed out.

Mode of Living; Dwellings; Dress. — From the time they first became known to the whites until a few years ago the Yaquis lived mainly in seven large villages² and subsisted by cultivating the very fertile neighboring country. No necessity existing for

¹ An account of the later wars of the tribe is given by Hernandez.

² Belem, Rahum, Potam, Bicam, Torim, Bacum, and Cocori. Two or three other settlements are mentioned by different writers. It is uncertain what became of "Yaquimi."



YAQUI YOUNG MEN



YACUI WOMEN

scattered ranches, the people became grouped into large communities. The majority of these settlements are now abandoned to the Mexicans. Torim, Bicom, Potam, and Cocori, all of which I visited, have been more or less transformed into ordinary Mexican towns, with regular streets and rows of adobe houses occupied by newcomers under constant military protection. Only some of the more Mexicanized natives remain; the rest are either scattered in the mountains and over southern Sonora generally, or have been killed or captured. An uncertain number remain in the almost impenetrable cholla, mezquite, and other forbidding undergrowth that covers the entire country along the river, harassing the soldiers and keeping them constantly on the alert. The military not only garrison the former Yaqui towns, but have built a number of picturesque adobe and palisaded forts in the country (see pl. VII, 1).

The native dwelling in the towns mentioned has not yet been entirely superseded by that of Mexican construction. It is generally a fair-sized quadrilateral structure of poles and reeds, or of adobe and reeds or brush, with a flat or, more commonly, slightly sloping roof of grass and mud. The same type of dwellings is seen where the Yaquis live undisturbed; they are identical in style and material to those of the Mayos, and are very nearly like most of those still built by the Pimas and the Opatas (pl. VII). The structure consists usually of the main hut, substantially made, and a connected shelter in which the cooking and most of the indoor work are done. In the country districts I have come across an occasional, probably temporary, hut made in the same manner, but entirely of brush and with but few supporting poles. (Plate VII, 4.)

The simple life of the family in all of these dwellings does not differ materially from that which prevails among most other Indians in warm countries. There is hardly any furniture. The family sleep on petates. Sometimes there are a box for the better clothing, a water-jar, a saddle, one or more water-gourds covered with a mesh of raw-hide, a violin or harp of native make, perhaps a blanket or two, and occasionally a few crude pictures of religious subjects. In the kitchen are a metate and a supply of crude cooking utensils.

The dress of both sexes among the Yaquis is almost wholly like that of the ordinary Mexicans; the only wholly native articles are

the now rare blankets and fajas and the somewhat more common sombreros.¹

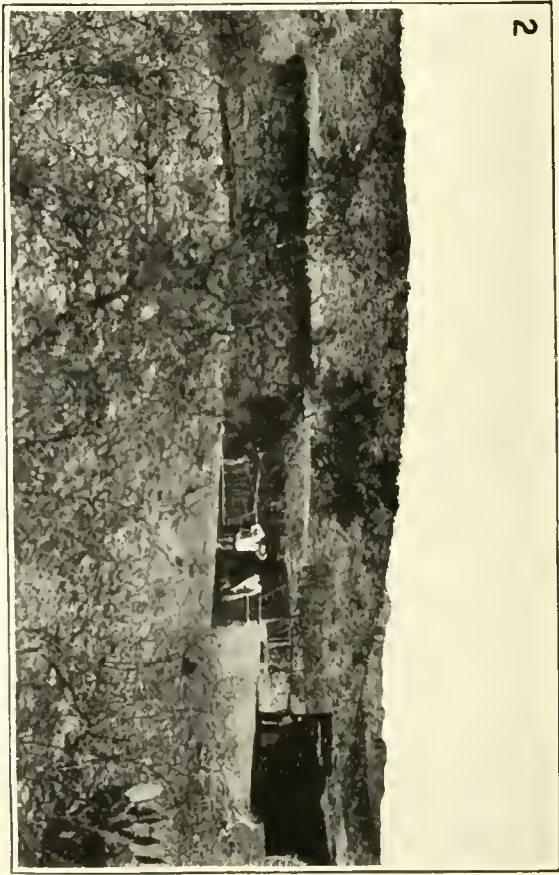
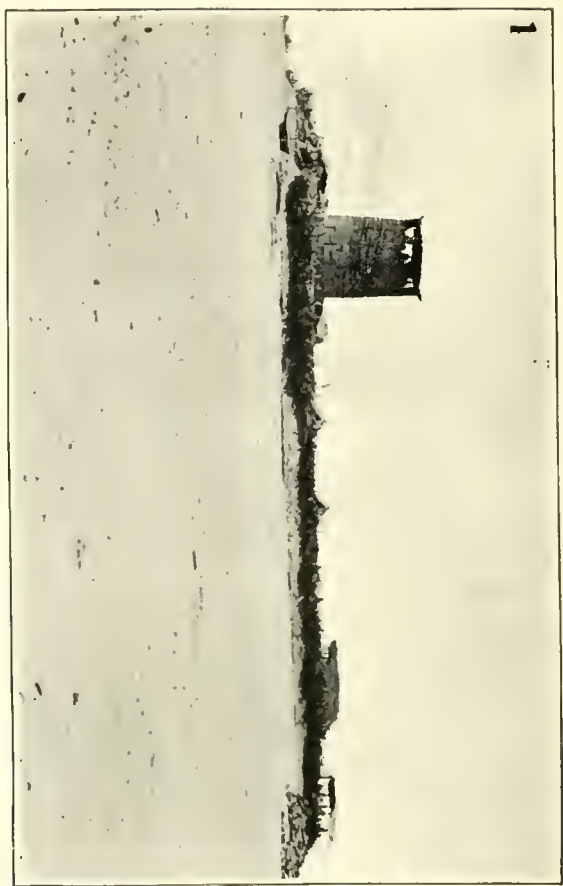
Industries. — My observations and information concerning the industries of the Yaquis may be briefly summarized by saying that, whenever a good laborer or an artisan is required in Sonora, a Yaqui is greatly preferred. As to details I can do no better than to quote the former governor of Sonora, Ramon Corral,² for in this respect, except as to weaving, the conditions of 1884 still prevail :

“ The principal industries of the Indians [speaking of the Yaquis and Mayos together] are agriculture, cattle raising, and commerce. Moreover, they are very apt in making cotton and woolen stuffs, using very imperfect apparatus of their own construction. They also make hats and very fine mats from palm leaf, shovels, reed-baskets of different forms, and other objects which they sell at Guaymas and other neighboring settlements. They gather the indigo which is produced in abundance on both rivers [Yaqui and Mayo], and prepare the color ; tan the skins of various animals ; gather honey ; and, in a word, exploit the inexhaustible virgin region to the utmost that their culture permits.”

“ Over all the districts of the state, especially in those of Ures, Hermosillo, Guaymas, Alamos (Mayos), and Sahuaripa ; in the adjacent regions of Sinaloa (Mayos) ; in Lower California, and in the mineral districts in the Chihuahua Sierra Madre, there are scattered a great number of these indigenous Yaquis and Mayos, who occupy themselves in all classes of work, from labor in the fields to the exploitation of mines and from the use of the plow to that of machines. It is they who compose the laborers of the haciendas ; they are the working element of the mines ; they are the best mariners of our coast ; they fish for the pearl in Lower California, are employed in all kinds of rural construction and work, form the domestic service, and execute whatever public work is undertaken. They resist equally well the cold of the winter and the great heat of the summer, and one of them is capable of performing twice as much work in a day as the best of white laborers. It is not rare to see some of

¹ At Mazatan (see pp. 66-67) a number of the slain men had on ordinary American jeans overalls. In the abandoned camp there were modern stockings and small-heeled women's shoes ; and near the body of a child lay a little handkerchief with colored border and a picture of a boy with an English verse in the middle. No such gaudiness as is common among many of the United States Indians is ever seen among the Yaquis.

² Op. cit., p. 12.



1. A Mexican fortress in the Yaqui country. 2. Opata dwellings at Tuape, Sonora. 3. A small Mayo village near Guadalupe, Sonora. 4. Yaqui dwellings on a plain 20 miles east of Hermosillo, Sonora.

these Indians manipulating complicated instruments and machines with the ability of mechanics.'"

Arts; Decoration; Food.—The manufacture of cotton and woolen fabrics has greatly declined. The only clothing of native weave now to be seen among the Yaquis is the faja and the white serape, the latter ornamented with one or two broad stripes in pale blue and natural brown or black; but even these garments are scarce.

A few articles, particularly rings, earrings, and beads, are made by the Yaquis from silver or other metals. The rings, as a rule, are simple bands, much like those sold cheaply on gala occasions, sometimes with sharp edges and usually showing the weld. The earrings are mostly of one style, probably after the Spanish, but they show better workmanship. The metal beads seen were all rather rude and often angular, looking like drops or pieces of native silver modified by hammering. On the whole the Yaqui silver work seems to be inferior to that of the Navahos.

On ranches each Yaqui employed keeps a personal account, which he carries in a tube made from the native bamboo. Each of these tubes is differently decorated on its surface with numerous incised figures, mostly of geometrical pattern. These figures are not strictly property-marks, yet they serve to distinguish the tubes.

The bows and arrows (pl. VIII) made by the Yaquis are remarkable. On the battlefield in the Sierra de Mazatan, on the site of the camp of the non-combatants,¹ I found them in all stages of manufacture, and

¹ In June, 1902, a force of 200 to 300 free and armed Yaquis descended one evening on four haciendas near Hermosillo and, without doing any damage, took away, partly by force, over 600 Yaquis there employed. The whole party proceeded in the direction of Ures, with the intention of reaching the safe upper Yaqui country. A little southwest of Ures the party had a skirmish with soldiers, whom they defeated. Shortly afterward the Yaquis reached the isolated, rough, but not very high mountain called Sierra de Mazatan, nearly south of Ures. Here they waited for the soldiers. The armed party separated from the rest and took up a strong position on a rugged ridge facing westward. The men, women, and children from the haciendas, with a guard of about a score of armed men, made a camp on sloping ground, thickly overgrown with visaches, etc., separated from the ridge by a rough though not very deep barranca. It was in this camp that some of the men commenced to make bows and arrows, rude spears consisting of pointed sticks, and clubs. On the night of June 15th a force of about 900 Mexican soldiers, under General Luis Torres, instead of attacking the armed Yaquis from the front, as the latter expected, rounded the mountain and in the morning surprised the camp of Indians from the

in the barranca, where the Indians had been surprised by the troops, there were arrows and bows that had been used. The bows are plain, nearly 5 feet in length,¹ flat, but slightly arched, and occasionally are strengthened with sinew; they require considerable strength to draw them. The arrows² are stout and measure $2\frac{1}{2}$ to more than 3 feet long; the shaft consists of a stout, hollow reed, while the long point, of more or less prismatic shape, is made, often crudely, of hard, sometimes knotty, white or reddish wood. At short range the Yaqui arrow is no doubt a most effective weapon.

The only club found at Mazatan is made of heavy, dark-red wood; it is 56.5 cm. or $22\frac{1}{4}$ inches long, nearly cylindrical, and has a perforation for a thong at the end of the handle.

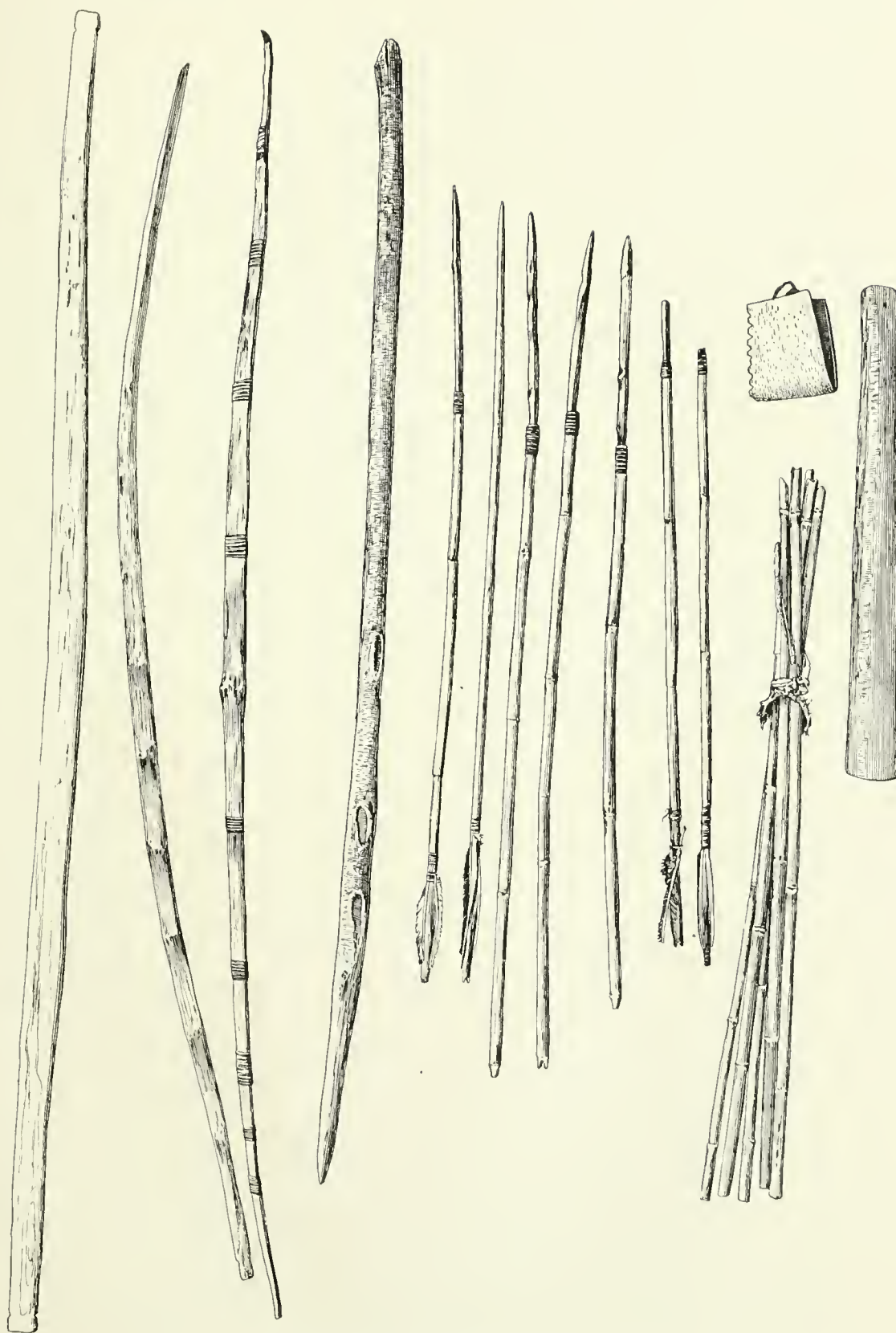
On my return to Hermosillo, General Torres presented me with a large ball-cartridge (now in the National Museum), the powder as well as the ball of which were made by the Yaquis, who, when hard-pressed for ammunition, pick up all the cartridge shells they can and refill them for further use. Our finding of heaps of Mauser cartridges at Mazatan was sure proof to my *rurales* that no Yaqui had visited the field after the battle.

The Yaqui women make several kinds of uncolored palm

haciendas. At the first volley the entire party, except those who were wounded or killed on the spot, ran down the mountain, most of the women and the armed guard directing their flight through the barranca. The soldiers following, killed many here and took the rest prisoners. In one part of the gulch resistance was offered by the armed guard. The main armed body of the Yaquis was too far away to actively participate, and when the panic began, that part, with some of the men from the haciendas, escaped over the mountain. I visited the field with some *rurales* three weeks after the affair, and as no one had preceded us we found everything as left by the Indians and the soldiers. We found the bodies of sixty-four Indians, including those of a number of women; in one nook in the barranca there was a heap of twelve bodies of women and the body of a little girl, while in another place there was a cradle-board (pl. IX, 1) and some bones of a baby. In one spot a row of men lay executed, and a similar row was buried below the mountain. My object in visiting the place was to obtain skeletal material, in which I was successful; but most of the skulls, whether from a peculiar effect of the Mauser cartridges or from the closeness of the range, were so shattered as to be of no use. The material collected is now in the American Museum.

¹ No. 65-2511, A.M.N.H., shortest of five, 126 cm. (49.5 in.); No. 2502, 141 cm. (54.5 in.); No. 2507, the longest of five, 146.2 cm. (57.75 in.).

² No. 65-2531, A.M.N.H., without point, 86.7 cm. (34.25 in.). Bunch of shafts average length, 77 cm. (30.38 in.). Arrow 2524, shaft, 65 cm. (25.62 in.); point, 23.3 cm. (9.25 in.). Arrow 2522, shaft, 73.25 cm. (29 in.); point, 20.2 cm. (8 in.).



PRIMITIVE YAQUI IMPLEMENTS OF WAR
(Specimens in the American Museum of Natural History, New York.)

basketry ; they also make hats and *petates*, or mats, from the same material.

The most common basket is quadrilateral with rounded corners, or cylindrical, woven in checker pattern from palm strips about half an inch broad ; such baskets are used for ordinary household purposes. A much better but rarer form of basket is woven in twilled style from narrow palm fiber. It is cubical, cylindrical, or bottle-shaped.¹ The last two kinds are double, consisting of a somewhat coarse interior layer and a finer exterior layer. Each basket has a neatly made cover. The only decorations employed consist of varied woven bands, and, in the cubical baskets, of tasteful modes of exposing and ending the fibers. The hats are made in the same way as the double baskets ; they are light, with a broad concave rim and a semiglobular body, differing very much from the ordinary pointed, high, heavy Mexican sombrero. The mats, which are used mainly to sleep upon, are made of the same broad fiber and in the same checkered pattern as the ordinary baskets. It is probable that occasionally material other than palm strips is employed.

Simple baby-boards are constructed by fastening together native bamboo splints and adding at the head a properly bent hoop which supports a cloth to shade the head of the infant.

The women make some ordinary pottery.

Decoration of the person is practically restricted to the women and girls, who wear necklaces of various beads with usually a small iron pendant, bead bracelets, earrings, and rings. I neither saw nor heard of painting or tattooing among the tribe.

In food the Yaquis display at least one peculiarity, which I witnessed ; this consists of eating the burro.² They are also said to

¹ This last form is probably made only for sale. I obtained specimens from the captives at Guadalajara. Examples of all the varieties mentioned, as well as of the hats, were collected on this trip and are in the American Museum. A somewhat similar cubical covered basket is made by the southern Tepehuanes. More technical notes and illustrations of these specimens will appear in Dr O. T. Mason's work on basketry, shortly to be published by the National Museum.

² On how little these people can get along, and how resistant their constitutions, was well demonstrated at Mazatan. Here over 300 women and children were taken captive and confined in a cattle corral of the nearby Rancho Viejo. These captives, according to reliable information, received nothing to eat, owing to lack of supplies, until the next day, when they were given a fanega (about two and a half bushels) of raw corn. The women

like horse meat, like the Seris, but do not consume it raw like the latter. Maize, prepared in numerous ways, is their chief diet, and fruit comes next.

Social Conditions; Observances, etc. — There is no organization among the Yaquis except of that part of the tribe which lives practically free and conducts the revolutions; but most of the remainder are bound closely together by strong sympathies, thus hindering any extensive blending with the whites. The hostile contingent recognizes rule by the elders, and these are generally headed by one or more leaders. The height of their organization was reached under the chiefs Banderas (1825-32) and Cajéme (executed in 1887); the name of the present leader is not known. There is said to be no secret organization among the warriors, and apparently the authority of no one in the tribe reaches further than it can find willing adherence or can be enforced. Not a few of the Yaquis actually serve in the Mexican army, and during the uprising of 1902 I saw some among the Hermosillo volunteers, enlisted to fight their own people.

There are now apparently but few purely native observances among the Yaquis of the haciendas, and the same may be said of the old customs. Velasco,¹ in 1850, mentioned four special Yaqui dances, the "Tesguin" (Tevin), "Pascola,"² "Venado," and "Coyote,"³ and at least three of these still survive among the freer

contrived to kindle a fire and parch the corn, on which they subsisted until nightfall, when they were marched to Hermosillo, about 35 miles distant. One of the men, whom I later examined in the hospital at Hermosillo, was badly wounded in the knee at Mazatan, but he crawled away into the brush where he hid for six or seven days, subsisting on anything he could find. The last day, from extreme thirst, he drank his urine. Finally he reached an arroyo. He was taken in a car to Hermosillo, where his leg was amputated. Two weeks later, when I saw him, he was approaching recovery, being strong enough to permit me to measure him. Similar instances might be cited.

¹ Op. cit., p. 74.

² Escudero (op. cit., p. 135) calls this dance *Pascol* and says it was thus named because it was celebrated particularly during Easter. This dance, as well as the Venado and the Coyote, are still practised. The principal feature of this Pascol dance is a masked and otherwise especially attired individual, preferably some old and sagacious man, who devotes his time to relating satirical, moral, amusing, or critical tales and epigrams.

³ In the "Venado" a male dancer carries on his head the head of a deer and performs remarkable muscular evolutions. In the "Coyote" or rather "Coyota," the dancers are a male and a female, and the dance, without being immoral, is said to be highly voluptuous. Compare Zúñiga and Hernandez.

members of the tribe. At the haciendas, however, or at Mexican fiestas, Yaqui music and dancing, as well as other Yaqui customs, are becoming more and more like those of the Mexicans.

Zúñiga, Velasco (page 78), and Escudero mention a peculiar but now apparently unknown Yaqui custom of exchanging wives. Escudero¹ says the observance was a part of a fiesta or ceremony called *Tutile Gamuchi*, and those who did not exchange wives on this occasion were not considered good Yaquis. Hernandez² says he found no trace of this, nor could he obtain any account of it from the Yaquis themselves. If any survival of such a custom still persists it can be only among the free members of the tribe, observations among whom are lacking.

A former custom, traces of which are still heard of, was the initiation of the youths by the warriors.³ This ceremony, apparently identical with that practised by the Opatas,⁴ consisted in giving the applicant useful counsel and in subjecting him to various tests of endurance, particularly by lacerating him with eagle's claws.

Marriage, natal, and mortuary ceremonies are mainly Catholic, but from what I could learn of the subject they are never without a strong tinge of the native. Among women marriage usually takes place very early. The bridegroom is chosen, at least nominally, by the father of the girl. The dead are buried in the ground. No tribe in Sonora practises cremation.

Character. — The Yaqui, as all agree who know him and as can be easily seen anywhere, besides being a good workman is generally orderly, cheerful, intelligent, endurant, and brave. He loves music,⁵ dancing, and sport, and greatly appreciates wit and humor;⁶ but he is also easily provoked to rebellion, is occasionally inclined to shiftlessness and to drink to excess, is quite superstitious, and is

¹ Ibid., p. 135.

² Op. cit., p. 94.

³ Compare Hernandez, p. 91.

⁴ *Rudo Ensayo*, pp. 86–87.

⁵ Not a few of the younger Yaqui men know how to play the violin, flute, guitar, or harp. They learn this simply by perseverance, without any special instruction. They make their own violins, as do the Tarahumares and many other Mexican Indians, and also the flutes, harps, and occasionally drums.

⁶ "The Yaquis are celebrated for the exuberance of their wit."—Hardy, op. cit., p. 772.

never very provident. From my own observation it would seem that the Yaqui is in no way radically different from the typical Indian, save that he is of superior physique and virility.

The best account of the bravery of the warring Yaquis was given me by the Mexican army officers who fought or still fight against them.¹ They run if defeated, but once captured they offer no complaint and make no effort to escape execution, their usual fate. Velasco² wrote in 1850: "They are of firm character and nothing will move them when they decide upon some project or are guarding a secret. Even the Masons are hardly capable of equaling the Yaquis in the vigilance with which they keep their mysteries, secrets, or undertakings." The same is quite true today. No Yaqui captive has been known to turn traitor, even at the cost of life. The invariable answers of the prisoner to his questioners are: "*No se*" ("I do not know") and "*Caito culpa*" ("No fault").³

The determination of the Yaquis to resent Mexican encroachment on their land and white domination may be illustrated by merely stating that they have had important uprisings against the Spanish or Mexicans in 1609, 1740-41, 1764-67, 1825-27, 1832, 1840, 1867-68, 1887, 1889-1901, and 1902. Since 1825 the tribe has never been really at peace.

The warfare of the Yaquis is not that of savages. They have

¹ The higher officers of the Mexican army are, as a rule, educated men and gentlemen; but the common soldiers are often recruited from criminals and are undoubtedly responsible for much of the gross injustice and many of the barbarities committed against the Indians.

² Op. cit., p. 74.

³ Two days before my visit to Torim, some soldiers found a Yaqui eating *pitayas*. They shot him in the thigh, took him to Torim without any treatment of his wounds, and cast him into prison. A short time before a person obnoxious to the Yaquis was killed in his house, and as a rifle and a belt of cartridges were found near the prisoner, he was suspected of complicity at least. There was, I was told, no trial. Early next morning they placed the wounded man on a burro, telling him they would conduct him to a hospital; but he answered that he knew well enough to what sort of hospital they were going to take him! They then tried to obtain from him a confession, promising him mercy as a reward; but the answer was the invariable "*Caito culpa*," and "You can hang me if you want to." So they took him out, riding on the burro and his wound still unattended to, more than four miles beyond the town, and hung him from a visache, where I found him on my way to Torim the next morning (pl. IX, 2). The history of the case was related to me by Torim Mexicans themselves.

many times in the past been reported to have plundered neighboring ranches, but I have learned of no such occurrence in recent time. Mail stages, sometimes with passengers and valuables, pass daily through their country ; only once during the uprising of 1902 was one of these attacked and its occupants killed, and then it was not certain that the deed was done by Yaquis. Instances of torture have been spoken of ; it is said that some captured Mexican soldiers were compelled to walk barefooted, or even with the soles of the feet cut off, over hot coals, but the statement of the occurrence is difficult to verify. It would of course be folly to suppose that all the Yaquis lack barbarity as well as other bad qualities.¹ Two Americans from Hermosillo were killed by members of the tribe near Torim,² but it appears that the men had been imprudent, endeavoring, in the face of warning, to photograph an armed band.

THE OPATAS

The Opatas have a good claim to be better known to anthropology. The tribe has nearly always been friendly to the whites, and, with other good qualities, has always shown a brave spirit. The people speak, or rather spoke, a language different from that of all the other large Sonora tribes ; they differ also in other ways, all of which increases the desirability of learning something of their original habits and relations. For much knowledge that could once have been acquired, it is now too late, but with persistent effort something might still be saved. The tribe is disappearing — in a manner exceptional among American tribes — by voluntary amalgamation with the whites, whose numbers in the Opatá country, since the termination of Apache hostilities, have greatly increased. In a few generations, under conditions similar to those of the present, the Opatas as such will have ceased to exist.

¹ Particularly after such examples as they witness in the Mexicans. They are distributed broadcast among the ranches, where they are practically in slavery. At the Guadalajara Hospital I examined over twenty women, nearly all speaking Spanish and belonging to the Catholic church, every one of whom had lost not only every adult relation but even her children, the latter having been torn away from their mothers and given to whomsoever applied for them. At the Hermosillo Hospital I saw a girl, seven or eight years of age, with three bullet wounds in her body, and there were also a number of wounded women. There is no end of such examples.

² Their bones still lay in the brush in 1902, but I was unable to recover them.

I visited this tribe in several localities, particularly at Opodepe, along San Miguel river, and at Tuape.¹ San Miguel valley is apparently the principal focus of the remnants of the people.

According to data gathered from all sources, small numbers of pure-blood Opatas may still be found at Masacauvi, La Concepcion, Suaque, Baviacori, Distancia, Aconche, San Felipe, Huepac or Huepaca, Banamiche, Sinoquipe, Arispe, Chinape or Chinapa, Biquache; also at Rayon, where they are mixed with the Pimas; and at San Miguel, Opodepe, San José, San Juan, Marysiche, Pueblo Viejo, Tuape, and Cucurpe, on the Rio San Miguel; with a few more in the district of Moctezuma and Sahuaripa (pl. iv, 3; pl. ix, 3).² In a number of these settlements which I visited there were but few pure-bloods. At the little village of Tuape, however, and in the adjacent Pueblo Viejo, the pure Opatas are still in large majority.³ Here also many of them still know their own language and preserve at least some of their customs and ceremonies, and probably some folklore and traditions. This fact, together with the proximity of Tuape to the railroad (less than a day's journey from Querobabi, on the Sonora Railroad), makes this locality especially favorable for investigation.

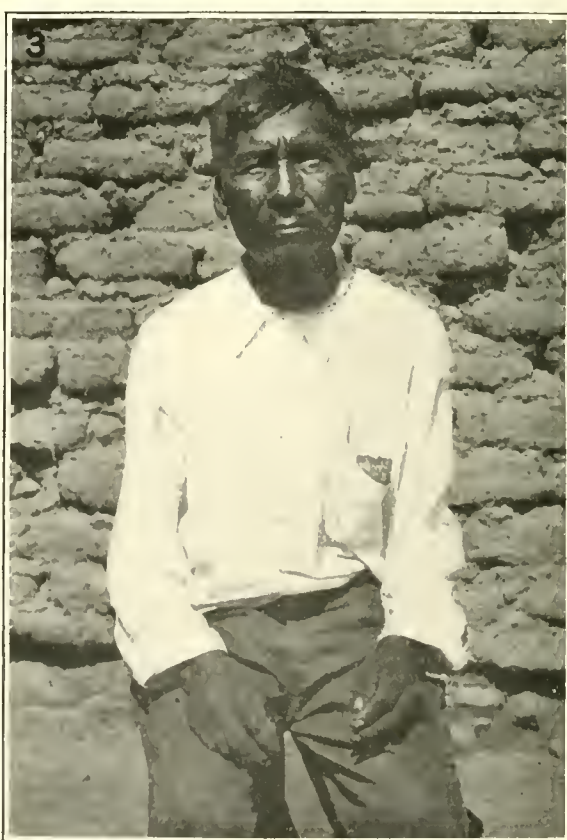
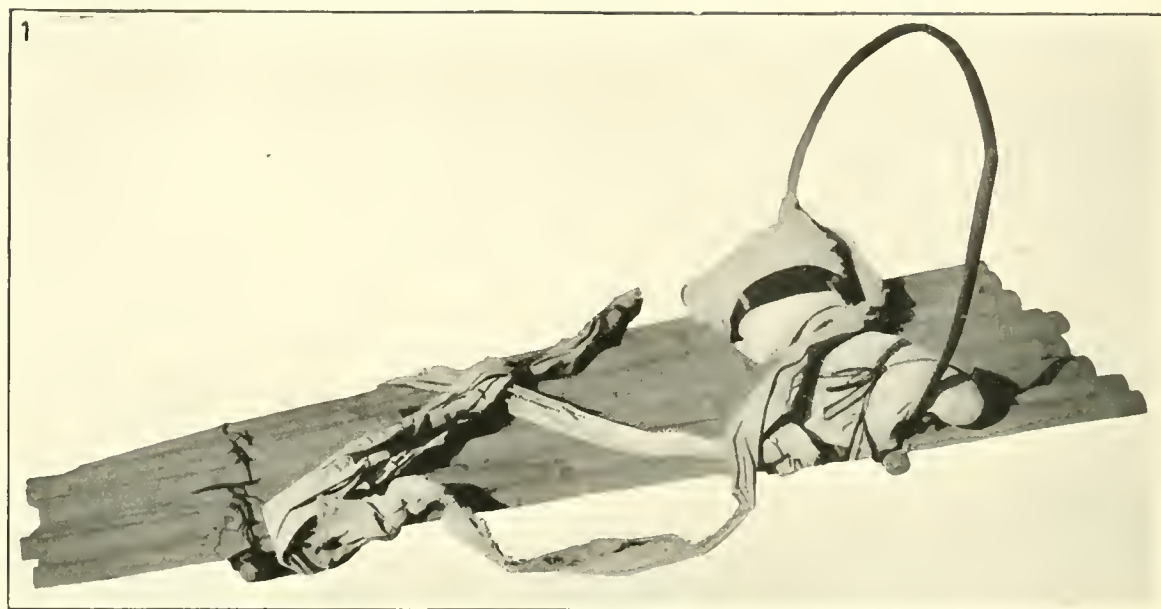
Dwellings; Dress; Industries. — The present Opatá dwellings are quadrilateral, with flat or slightly sloping roofs, thus following the general type of native dwellings throughout Sonora (pl. vii, 2). Formerly, I was told, the Opatas also built round structures. The materials used for the walls are stone, adobe, and reeds (or a combination of some or all of these), and zacate, reeds, boughs, and mud for the roofs. Formerly stone foundations or walls were common, with roofs of native timber, ocatilla, grass, and mud.

Of native costume but few traces now remain. Men wear pan-

¹ At Tuape I was so fortunate as to find two resident Americans, one, Mr James G. Chism, actually the *jefe político* of the village, the other Dr E. M. Alderman, a physician-miner, Mr Chism's companion. Both of these gentlemen have given me much valuable aid. I owe particularly to Dr Alderman, who has lived many years among the Opatas, a large part of the information herein noted in regard to the tribe.

² Some of these names differ somewhat in local native pronunciation from the usual orthography. For old Opatá pueblos see Bancroft, *North Mexican States*, 1, pp. 513-514; *Rudo Ensayo*, cap. vi; Hernandez, op. cit., pp. xii, xv.

³ According to the census furnished me by Dr Alderman, there are 41 pure-blood Opatas at Tuape and 154 at Pueblo Viejo; but here, as elsewhere, they are decreasing.



1, Yaqui baby-board, from the battlefield at Sierra Mazatan. 2, "Caito Culpa," executed Yaqui near Torim, Sonora. 3, Type of Opata man, San Miguel valley, Sonora.

taloon and shirts of manta, as do all the rural male population of the locality; the women dress in loose shirts, jackets, and skirts, all made of manta or calico. A few serapes of wool or cotton are the only specimens of native weaving now to be seen. In the past, Dr Alderman was told, these people made blankets or *tilmas* of coarse woven fabric, which were wrapped around the body;¹ originally this was the only article, except a breech-cloth, worn by the men. The women formerly wore short skirts made from the inside bark of the cottonwood, which was obtained in large sheets and scraped down nearly to the thinness of paper.

The chief occupation of the Opatas is agriculture, their crops consisting principally of maize, frijoles, melons, and chile.² They also fish in the rivers for a species of minnow, which they eat whole; formerly they netted them with their *tilmas*. Some of the men are employed as laborers, drivers, etc.

The Opatas make water jars and cooking vessels of clay, burning them to about the hardness and color of red brick. In ancient times, they say, they made a kind of stoneware, some of the stone jars being nicely finished inside and out and holding up to ten gallons or more. The women make hats and a few ordinary baskets and mats from the palm leaf; formerly they made baskets and water vessels of willow. They also make ropes and thongs from the fiber of the maguey and yucca, from which they also formerly manufactured snares for deer and peccaries, when these animals were very abundant in their country. This was the principal means of trapping known to the tribe. Of the same fibers they also wove better *tilmas*, which were worn at fiestas and on other great occasions.

It appears that the Opatas made four kinds of fermented liquor — one of corn (*tesvino*); one of mezcal;³ one of the fruits of various cacti, such as the saguaro, the pitaya, the cholla, and the nopal; and the last from the stringent native grape.⁴ *Tesvino* seems now

¹ Compare *Rudo Ensayo*, p. 95 et seq.

² *Ibid.*, cap. iv, sec. I.

³ *Ibid.*

⁴ “The wild grape is to be found all over the Province [Sonora] in damp ravines, creeping up the groves of willows, poplars and mezquites. It is called *hurague* in Opata, and is ripe in May and June. It is eaten by the Indians, who also eat the leaves; but it

to be the only native liquor, being sometimes made in San Miguel valley.

Social Customs.—There are now apparently no traces of tribal organization among the Opatas, and their only religion is an adaptation of the Catholic faith. To correctly determine the exact status of any people in these respects, however, would require personal and prolonged, specific investigation.

Along San Miguel valley the Opatas do not like to be regarded as Indians; they prefer to be called "Mexicans." Very few under thirty years of age can speak their native language; even if they understand it they do not like to employ it, and if any one addresses them in Opata, they answer in Spanish. According to Dr Alderman, in all the families of Tuape, with one exception, the older people speak the native language while the children use only Spanish.

The Opatas maintain their reputation for honesty, but there are exceptions among youths who come frequently in contact with whites. Crime is almost entirely confined to murder, the result of drink or jealousy.

Both sexes among the Opatas are apparently as much inclined to excess in drink as among the neighboring tribes; but there is nowhere north of the Rio Grande del Sur (Rio Tololotlan) such thorough addiction to drink as in many parts south of it—in the *pulque* or *caña* regions. The only native drink made today by the Opatas of San Miguel valley is, as above mentioned, a rather weak *tesvino*, made by fermenting corn with yeast. Occasionally the corn is first made to sprout, which was the original method. This liquor seems to leave no permanent bad effects. Unfortunately, at the numerous fiestas, particularly among the *vecinos*, the Indians consume much Mexican mezcal or other liquor, often of a vile quality. Alcoholic drinks of all kinds generally produce at first a state of hilarity, manifested by singing, shouting, playing, dancing, and sometimes by fighting; this is followed by stupidity and finally stuporous sleep.

is acrid and of little benefit. I have seen vinegar and even rum made of it, but it is seldom used for this purpose."—*Rudo Ensayo*, cap. iv, sec. 1. Among the Pimas, "the wine or drink, with which they become intoxicated, is made out of maize, the maguey called mezcal, wheat, Indian fig, and other things; but the worst of all is that made of the alder tree."—*Ibid.*, cap. v, sec. 4.

The women are reported to be virtuous, but those addicted to drink are said usually to become dissolute; for neither vice, however, are they ostracized, and indeed occasional drunkenness is not regarded as at all degrading.

The Opatas deny that polygamy ever prevailed among them, but they acknowledge that occasionally men had concubines.

Traditions; Former Culture. — There are certain traditions among the Opatas, but the subject would require long and patient investigation and careful sifting from foreign elements. The younger generation, as among all Indians adopting white men's habits, are ignorant of their history. Perhaps the Opatas farther eastward, near the lofty sierras, preserve more traditionary lore than those of San Miguel valley. Bandelier¹ obtained from them references to their fights with the Casas Grandes (Chihuahua) people, which must have occurred in very ancient times, since the Casas Grandes structures have not been inhabited within the historical period. Their most vivid and numerous recollections, however, pertain to their long struggle against the Apaches.

As to the former culture of the tribe we must rely mainly on the account preserved in the *Rudo Ensayo*. A few surmises may also be made from relics found in the Opata country. According to Dr Alderman the only farming implement found is a hoe made from *guayacan* (lignum vitæ), but stone axes, mealing stones, and stone mortars are found quite frequently. Arrow-heads and lance-heads of bone are also often found, but few of flint have been discovered, and these are believed by the Opatas to have been lost by other tribes, especially the Apaches, while at war with them. A few broken clay images have been unearthed, but none of these nor any of the other specimens mentioned have been preserved.

Native Observances. — The chief one of the few entirely native observances still practised is known as *Taguaro*,² which purports to be the celebration of a peculiar victory once achieved by some Opata women over a band of marauding Apaches. According to

¹ *Final Report*, part II.

² According to the *Rudo Ensayo* the term *taguara* (there is no mention of the observance bearing the name) means the large sparrow-hawk (p. 46), while *taguaro* was the plant *toloache* or larger *estafiate* (p. 61 orig.).

the more or less variable tradition, an important Opatá pueblo, in which was kept the much-coveted figure of the powerful god Taguaro, was one day suddenly attacked by Apaches while the men had departed for some reason, leaving the women alone. The Apaches were always enemies of the Opatas, and on this occasion they wanted above all to get possession of the idol. It chanced, however, that they were discovered by some women who went to get water; these alarmed the others, and all armed themselves, principally with ashes, with which they blinded the invaders, threw them into confusion, and finally repulsed them. The men returning soon after, the pueblo with its precious idol remained safe. The strange victory was attributed to aid from Taguaro, hence the *Taguaro* is now celebrated in its commemoration.¹

El Taguaro is held the first Monday after Easter week. A doll is made from straw and rags, in representation of Taguaro, and is placed during the night preceding the ceremony on top of the church tower. Early in the morning of the *Taguaro* day a band of Opatas, dressed to represent Apaches, with faces and bodies painted, and armed with bows, arrows, and guns, proceed for a certain distance beyond the village, then turn and simulate the stealthy approach of an enemy. They pass unnoticed until near the church, when suddenly they begin yelling and shooting at the stick on which the image is perched, trying to knock it down. They eventually succeed, and as the image falls they pounce upon it and dance with it through the village, carrying it away. But as they reach the plaza they are confronted by the women of the settlement, who carry baskets and other utensils hidden under their rebozos. The two parties commence to taunt each other, and finally rush together as in battle, whereupon the women reach into their receptacles and the rushing "Apaches" are treated to a shower of ashes, which blinds them; they are thus thrown into confusion and the entire invading

¹ I find only one report of this observance and that in Hernandez, op. cit., p. xii. According to this author the Apaches "come and steal burros and women, and the inhabitants of the pueblo come to the defense and to recover what has been taken. After this the people go to the plaza, where stands a high pole with a figure or doll (*muñeco*) on the top, which is the Taguaro. The old ones come with some rattles and sing, while the warriors shoot at the figure and according to their dexterity receive ovation or vituperation."

party retreats, pursued by the women who take as many prisoners as possible. Sometimes half a dozen women seize a single "Apache" and carry him off with them by main force. Finally the whole attacking party is dispersed or taken captive, leaving the image of Taguaro in safety. The prisoners are taken to the guardhouse, and in order to gain freedom are obliged to pay a fine (in Tuape usually two and a half pesos). The money thus obtained is generally expended for drink.

Thus is the occasion celebrated one year. The next year the doll is made and put in place by the men who the year before belonged to the attacking party, and a band of women dress in representation of Apaches and attack the town, while the men at home take the part of the women with the ashes, etc.

Another ceremony still observed is known as *La Cuelga*,¹ and occurs the day after the *Taguaro*. There are music and dancing, but the principal feature is an exchange of gifts between men and women, mostly, though not exclusively, between husband and wife — the peculiarity of the giving being that the receiver is bound at the next *Cuelga* to repay the donor at a double rate. There is no limit to what may be given: it may be a piece of money or a cow, and the custom is a source of much merriment as well as of some vexation. Articles that cannot conveniently be made up in a package are transferred by means of signs or of writing in a wrapper or an envelope.

These observances were witnessed by both Dr Alderman and Mr Chism, and their description agrees with the above. The same custom, with variants, is observed in several places besides Tuape.

In former times the Opatas practised, with ceremony, the initiation of young men as warriors.² They also had a nocturnal dance as an invocation for rain, in which "a number of girls, dressed in white or simply wearing a chemise, would come out at night to dance in a place previously well swept and embellished, leaving behind them, in the house from which they came, their musicians,

¹ Hernandez (op. cit., p. xi), who also speaks of this observance, citing an unnamed author, says it is known as "*Dagüinemaca*" ("Give-me-and-I-shall-give-you") and is in commemoration of the fraternization of the Opatas and the Spanish. The "double rate" is not mentioned.

² *Rudo Ensayo*, pp. 86-87.

who consisted of old men and women, making a noise with hollow gourds, sticks and bones."¹

In addition the Opatas have numerous nominally Catholic fiestas, of which drinking seems to be the general culmination.

Physiological and Medical. — Opatas girls generally attain puberty during the twelfth or thirteenth year, but Dr Alderman saw two girls who reached this stage at about nine years. Puberty, as well as the established function, seldom occasion difficulty; yet there are exceptions. The menses last mostly from three to five days; menopause generally occurs between forty-five and fifty years. Women remain secluded during menstruation.

Opatas girls now marry at all ages after puberty, although generally between fifteen and eighteen years. Marriage is seldom contracted as a result of mutual love, it being arranged by the parents. During married life the woman occupies a subordinate position, not, however, without having and asserting some rights of her own and enjoying considerable liberty.

A few cases of sterility have been observed, but in general the Opatas women are prolific. Five or six children in a family are common, and there are instances in which one woman has borne twelve, fifteen, and even more children. Nevertheless, a large grown-up family is not usual, many of the children dying, particularly of intestinal disorders, when young. Twins are born occasionally, probably somewhat more frequently than among whites.

With the aid of Dr Alderman I have obtained the following limited statistics, which were recorded with reasonable care and after repeated inquiry. As among all Indians, it is hard to obtain the actual facts of this nature among the Opatas, owing to ignorance and prejudice. But few of the Opatas know their age, hence most of the ages could only be approximated by asking the Indians how old they were when the French were in Mexico, or when the cholera raged in their country, or if they remember when gold was discovered in California, etc.

The interest of the different columns is self-evident; they show the fertility of the people, the high mortality of children, the very

¹ *Rudo Ensayo*, pp. 79-80 (173 of trans.). For accounts of further observances see *ibid.*, cap. v, and Hernandez, *op. cit.*, p. xii.

early age at which women frequently commence to bear, a large percentage of miscarriages, and frequency of twins.

NAME	AGE	CHILDREN			AGE AT BIRTH OF FIRST CHILD	MISCARRIAGES	TWINS	CONCEPTIONS
		LIVING	DEAD	TOTAL				
1 Antonia Villa	31	4	3	7	15	1	—	8
2 Maria Angeles	34	4	2	6	23	—	—	6
3 Oulana Tabinico	40	5	1	6	17	—	—	6
4 Luisa Albera	50	9	6	15	17	2	—	17
5 Francisca Pares	52	2	4	6	20	2	—	8
6 Salome Urquidas	53	4	2	6	15	1	1	7
7 Jesus ¹ Murietta	58	8	14	22	15	3	2	25
8 Pascuala Robles	62	3	2	5	15	—	1	5
9 Gabriela Sierra	62	8	12	20	15	5	—	25
10 Jesusa Vergana	64	5	7	12	17	2	—	14
11 Delfina Atondo	64	7	2	9	26	4	—	13
12 Josefa Cocoba	65	2	1	3	27	1	—	4
13 Valerina Pares	69	0	9	9	13	3	—	12
14 Albina Ajesta	82	8	11	19	14	—	3	19

Some of the miscarriages are undoubtedly due to syphilis; others, in Dr Alderman's opinion, are caused by the women lifting heavy loads on and off their heads, this being their favorite mode of carrying, the women conveying in this way nearly all the water used by the family from the rivers up trails to their houses, which at Tuape are 75 to 100 feet above the supply. The jars in which they carry the water often hold six gallons, and when filled weigh

¹ Some names, although possessing a feminine form, are used for both sexes in the same form. Two children in the same family may bear the same name. Dr Alderman writes me, Oct. 16, 1903, on this interesting subject as follows: "You would find in almost all the families two of the same name and sometimes more. They name their children after the saints, such as Jesus, Juan, José, etc. And if a child dies, the next child that is born in the family takes the same name in memory of the departed. In some of the large families, as many as three, or even four, children have honored some one saint by wearing his name. Some of their names are used for both girls and boys, such as Jesus, Refugio, etc. It is true that these names have a feminine termination, as Jesusa, Refugia, but these people use the masculine name for both sexes. In rare cases I have known two of the same sex and same name in one family, and both living. It is not very exceptional to find a brother and a sister by the name of Carnacion, and often two little Jesuses in the same family, full brother and sister. In a house adjoining the store where you worked when you were here, there was a case of this kind, although the people were not of full blood."

about 55 pounds. To raise this load and put it on the head certainly cannot be conducive to the safety of a pregnant woman.

Most of the children die, when young, from intestinal disorders, measles, and occasionally smallpox. But little care is taken of the health of the children. No effort is made to avoid contagion or epidemics. On the contrary, mothers will deliberately expose their little ones to measles and other contagious diseases, believing that they must contract them sooner or later and that it is better for them to get through with it. I have met with a similar sentiment and practice in several localities among the white Mexicans, and indeed it is not unknown among our own people!

Although Dr Alderman has attended nearly fifty confinements among the Opatas, he never observed a deformed pelvis, and I have not seen one. The external as well as the internal genital organs do not differ appreciably from those of whites. In only a small proportion of the cases is the pubis or the axilla without hair.

The foetus is believed to breathe in the womb, air gaining access to it through the vagina; should the latter be occluded in any manner, the child will lose its breath and die. An Opata woman recently testified to this effect before a judge.

Labor lasts usually from eight to eighteen hours, but instances are known of a duration of but a few minutes, while, on the other hand, in a small number of cases several days elapsed between the first occurrence of pains and the delivery, without prolonged interruption in the pains. There are but few instances in which the labor was more or less atypical and really difficult. Among the cases in which he assisted, Dr Alderman has seen but one feet presentation; he never saw nor could I learn of any monstrosities.

In labor the woman usually kneels or squats with her feet apart. She is attended by her nearest female relatives, but other women and even men and children may be present: the event is not considered one making secrecy necessary. A rebozo, or light shawl, is tied about the woman's abdomen, above the fundus, and tightened as much as "two women can draw" (Alderman). During the pains (at any period of the labor) a woman takes the patient (who has assumed a sort of sitting posture) by the hips and shakes her violently to and fro; this manipulation is repeated at intervals until the child

is born. Sometimes two women, one at each side, will alternate in pressing strongly on the fundus.

The cord is tied and cut. The placental portion must in some way be fastened to the thigh, otherwise, it is believed, it might recede and be lost within, when the woman could not be delivered of it and the after-birth. The placenta, however, seldom causes trouble; it is buried, with no special care or secrecy. The toilet of the mother is restricted to drying with pieces of cloth, washing being delayed until the *dieta* is over. If flooding occurs, the women set fire to mescal wine, which, when warm, is extinguished; into this is then dipped a piece of muslin which is introduced as far as possible into the vagina. This treatment is sometimes, though not generally, effective.

After delivery the woman usually remains four or five days in bed; but she observes a *dieta* for forty days, during which time she must not wash nor comb her hair. The *dieta* consists of the exclusion of chile, frijoles, fresh meats, etc.; the woman subsists solely on a little dried meat, chicken, eggs, and a few other simple unstimulating foods, with but a small allowance of salt. It is probable that this limited diet is in part the result of Mexican influence. Nursing is generally normal, although it happens, particularly in the more fleshy women, that the secretion is scanty. As among others Indians the nursing is often prolonged until the child is two years of age or even older, but the child is weaned at once if the woman finds that she is again pregnant.

The Opata women attribute a peculiar influence on the health of the new-born child to the anterior cranial fontanel, though I have reason to doubt whether this is original with them. This soft place on the infant's head is called *mojera*, and is believed to be capable of "falling down," thus making the child ill. To prevent this, Dr Alderman told me, a woman takes the babe on her knee, lets its head hang downward, and, introducing her thumb into its mouth, presses strongly upward upon the palate, sometimes sufficiently to abrade it, thus "raising" the *mojera*. Sometimes, when an older child is sick, an old woman will suggest that its *mojera* needs "raising"; the child is thereupon lifted by the heels and shaken up and down.

Another curious belief of the Opatas which Dr Alderman has sometimes observed, is that people, and especially children, have a certain part of the intestine, called *tripiide*, which they may lose, but which can grow again.

Native medical treatment is on the decline among that portion of the Opatas more particularly dealt with here. I could learn of no medicine-men, of which there was no dearth at the time the *Rudo Ensayo* was written, but along the Rio San Miguel there are a few old medicine-women who know and use such herbs as peppermint, *rosa de castilla*, etc. Camomile, red-lead, and metallic mercury are procured from the dealers and are used quite indiscriminately. Dr Alderman, whose services are frequently demanded, knew of a child who was given a decoction of native herbs which resulted in death a few minutes later. Some of the old women's mixtures are said to contain twenty or more ingredients, as barks, thorns, roots, leaves, flowers, seeds, nuts, grass, and domestic supplies, such as coffee, rice, salt, sugar, tea, pepper, and egg-shells. These are sometimes boiled in water, milk, wine, or vinegar. Such concoctions are given even to babies while teething, and some of them, as might be expected, do not survive.

There is no doubt that there are many valuable medicinal plants in the region, some of which may have been well known to the earlier Opatas;¹ but nowadays they are rarely used with discrimination. For snake bites the people employ a lactescent cathartic plant called *golondrina*, while scalds or burns are sometimes treated by the application of dog excrement.

Prayers and offerings to saints are today resorted to more than medication by the Opatas, as by the white Mexicans.

Sick persons must not touch water except to drink, and they must not shave nor comb their hair, nor taste fruit of any kind. To cover the body with a coating of lard is regarded as very beneficial. Vermin, especially on a sick person, are believed to be healthful, and few can be found who are not supplied.

¹ The *Rudo Ensayo* is replete with accounts of native medicinal herbs and their uses, There were remedies for amenorrhœa, difficult labor, wounds, fractures, etc. The *peyote* was well known to the Opatas, as well as to the Yaquis. Treatment by incantation and sucking was also practised.

According to Dr Alderman the Opatas believe it to be unwholesome to bathe, except on San Juan Bautista's day (the great holiday of all Sonora Indians), when all water is holy and therefore harmless.¹

The most common disorders among the Opatas, as among all the Indians of the Southwest, are those of the digestive system; in infants, as above mentioned, they are often fatal. Malarial fever is also prevalent.

Among twenty-two women from San Miguel valley whom I measured, seven had goitres.² In these cases the enlargement was twice unilateral, only on the right side, and five times bilateral, but without exception larger on the right. The natives have no definite conception of the cause of this disease and no knowledge of how to cure it. All the goitres seen but one were of moderate size. I observed no case of the disease among the men, but was informed that they are afflicted with it also, though much more rarely than the women.

Venereal diseases are quite common, but, as among other north-Mexican tribes, serious syphilitic lesions seem to be rare. Rickets is unknown among those of pure blood. Pulmonary tuberculosis occurs, but is not prevalent; it seems to attack the half-breeds oftener than the full-bloods.

Insanity and idiocy are said to be very rare. In all his experience with the Opatas Dr Alderman knew but one insane person (a man who had the delusion that he owned everything) and but a single feeble-minded individual. I could obtain no information regarding children born blind or deaf. The only case of serious

¹ These beliefs are not wholly original with the Opatas, but were largely introduced by the Spanish Mexicans, among whom they are still prevalent. The ordinary Mexican is afraid of water. I have never seen my *moso* companions, and very seldom those of the better class of white Mexicans, wash. I was many times warned not to wash my hands and face every morning; and when toward the close of 1902 I was stricken with fever, it was the unanimous opinion of those about me that it was due to my morning *baños*. [Since writing the above I have found a similar state of affairs reported among the Mexicans of the Opata country in 1829 by Hardy (op. cit., p. 715); and I find also the following note in the *Rudo Ensayo*, p. 158 transl.: "These poor women [Opata] are in great need of such remedies [for amenorrhœa], for they go into the water and bathe at all times."]

² *Native Races*, I, p. 588: "The Opatas of Oposura are disfigured by goitre, but this disease seems to be confined within three leagues of the town."

nervous disease of which I could learn was that of paralysis agitans in a woman who had been addicted to liquor.¹

On the whole the Opatas are healthier and generally in better physical condition than their white or mixed Mexican neighbors; and were the main principles of hygiene inculcated into them and alcoholism prevented they would rapidly increase in numbers.

Lost Customs.—Among the customs the Opatas have abandoned are two that deserve particular mention. One is tattooing, which used to be practised on both sexes and from childhood (*Rudo Ensayo*, p. 84); the other is that of burial, in which the body was laid in a grave with all the effects of the individual—his favorite dish, basin of water, etc. (*ibid.*, p. 85). I have seen no instance of tattooing, while burials take place in the *campo santo* of the church and according to the rites of the new religion.

SERIS, PAPAGOS, PIMAS

Of the Seris I have met but one individual, the measurements of whom, for purposes of comparison, are given in the table at the close of this paper.

The Papagos and Pimas were both studied principally in Arizona. Many of the Pimas Bajos, as mentioned before, are of about the same culture-status as the Yaquis or Mayos; while the Papagos along the Sonora border still retain enough of their aboriginal customs to make them ethnologically important. The Papagos near Torres, south of Hermosillo, make characteristic white coiled basketry with red figures. Several comparisons concerning the physical anthropology of these tribes will be found in the tables.

PHYSICAL CHARACTERS OF THE SONORA INDIANS

As the details of my physical examination of the Opatas, Yaquis, and Mayos are being prepared for publication in another form, with

¹ An interesting case, probably allied to chorea, was recently communicated to me by Dr Alderman, as follows: "One of the men who work for Mr Chism looks, walks, and talks like a very drunken man, and this has been his condition since birth. He is married, and is the father of several children, whose intelligence is on a par with other Opatas children of the same age. He does not drink to excess, he is an expert vaquero, but rides in the most drunken manner, and how he manages to remain on his horse and throw his reata with precision is a wonder."

similar data on all the tribes visited, I will restrict myself in this place to a few particulars only.

The most important result of the measurements is the definite separation, particularly by their head-form, of tribes that have always been supposed to be of identical origin, such as the Yaquis and Mayos, and the Pimas and Papagos. But there are also other points of great interest.

The color of the Sonora Indians differs only individually; the pure-bloods are of the same brown as the Indians generally, ranging from light yellowish brown in some women and in some of the dressed younger men, to dark, nearly chocolate brown in others, particularly in some of the aged. The color of the little children, as a rule, is a live light to rich brown, of more uniform shade than in the adults.

The hair of the Sonora Indians is black and straight, growing to a fair but not extraordinary length. As a rule the beard is short and scant, particularly on the sides of the face.

The body is generally well-developed and, except in the old, is well nourished and regular. Some of the women past the prime of life are rather stout, but none are obese.¹ Their breasts are usually of moderate size. There is no steatopygia and no excessive abdomens. The feet and hands are always of moderate size.

The face usually exhibits more or less pronounced alveolar prognathism and prominence of the malars. The forehead is seldom as well arched as in the pure whites. The eye-slits are often slightly oblique, the outer canthi a little higher than the inner. As a rule the nasion depression is well marked in men, but is liable to be shallow and long in women. The nasal bridge ranges from straight to moderately convex, while the septum is either horizontal or slightly inclined downward. Regular and pleasant features are the rule in the younger Indians, but real beauty is very rare among the pure-bloods.

So much for the characteristics common to the Indians of Sonora, and indeed to practically all those of the Southwest. The tribal differences are scarcely detectable from casual observation; they are confined almost exclusively to physical proportions, as ascertained by measurements, and to the interrelations of these. The

¹ Some actually obese women are seen among the Pimas of the Gila, however.

Yaquis, whatever the cause may be, have among them taller and more powerful men than any of the Sonora tribes. The Pimas are the most dolichocephalic of the Indians of the region, closely approaching the ancient cliff-dwellers of southern Utah; the Mayos are the most short-headed, resembling in this respect the Opatas, Tepehuanes, and Nahuas.¹ The Yaquis are apparently a Pima physical stock, modified by mixture with the Mayos. The Seris seem to belong to the same type, possibly modified somewhat by the Apache. The Opatas are, according to many indications, a Tepehuane stock, with a considerable element of the Pimas or Tarahumares.

The above and other differences, on the details and signification of which I shall not now dwell, are shown in the accompanying tables.

As the data which I obtained in the Southwest accumulate, it becomes more and more apparent that we shall have to deal there not only with type but also with tribal differences in the various body dimensions; when these can be eliminated or explained, there is good prospect of reducing all the numerous ethnic divisions of that great and important region to probably three principal physical groups. It is also evident that close relations of a physical nature to the various Sonora tribes will be found both north and south of that region.

MEASUREMENTS

HEIGHT (*Males*)

	OPATAS (31) Percent.	YAQUIS (51) Percent.	MAYOS (53) Percent.	SERIS (1)	PIMAS (53) Percent.	PAPAGOS (50) Percent.
152.6 to 155 cm.	—	—	3.8		—	—
155.1 to 157.5	—	3.9	1.9		—	6.0
157.6 to 160	9.7	7.8	7.5		—	—
160.1 to 162.5	12.9	7.8	5.7		3.8	6.0
162.6 to 165	19.4	9.8	9.4		9.4	8.0
165.1 to 167.5	6.4	5.9	20.8		7.5	6.0
167.6 to 170	22.6	9.8	15.1		17.0	10.0
170.1 to 172.5	12.9	11.8	20.8	(1)	20.8	18.0
172.6 to 175	3.2	19.6	5.7		11.3	14.0
175.1 to 177.5	6.4	13.7	7.5		11.3	20.0
177.6 to 180	3.2	7.8	—		15.1	10.0
180.1 to 182.5	3.2	1.2	—		3.8	2.0
182.6 to 185	—	—	1.9		—	—

¹ Compare the tables in my paper in the July-September number of the *American Anthropologist*.

CEPHALIC INDEX (*Males, Undeformed Heads*)

	OPATAS (31) Percent.	YAQUIS (49) Percent.	MAYOS (50) Percent.	SERIS (1)	PIMAS (51) Percent.	PAPAGOS (50) Percent.
70-70.9	—	2.04	—		3.9	—
71-71.9	—	2.04	—		1.96	—
72-72.9	—	—	—		3.9	—
73-73.9	—	2.04	—		9.8	2.0
74-74.9	6.4	4.1	2.0		11.76	2.0
75-75.9	3.2	2.04	6.0		14.73	4.0
76-76.9	6.4	14.3	6.0		16.7	6.0
77-77.9	19.36	18.36	4.0		14.73	10.0
78-78.9	9.7	14.3	8.0		7.8	18.0
79-79.9	9.7	8.2	14.0		5.9	16.0
80-80.9	19.36	12.2	20.0		3.9	28.0
81-81.9	9.7	8.2	16.0	(1)	1.96	6.0
82-82.9	9.7	6.1	8.0		5.9	2.0
83-83.9	—	4.1	6.0		—	10.0
84-84.9	6.4	—	2.0		—	—
85-85.9	—	2.04	8.0		—	—

LOWER FACIAL INDEX $\left(\frac{\text{menton-nasion} \times 100}{\text{diam. bizygom. max.}} \right)$ IN MALES

	OPATAS (30) Percent.	YAQUIS (52) Percent.	MAYOS (53) Percent.	SERIS (1)	PIMAS (50) Percent.	PAPAGOS (50) Percent.
75-76.99	3.3	—	3.77		2.0	2.0
77-78.99	—	—	3.77		—	—
79-80.99	6.7	7.7	5.66		2.0	2.0
81-82.99	13.3	19.23	11.30		20.0	8.0
83-84.99	10.0	19.23	18.86		24.0	16.0
85-86.99	13.3	30.8	28.28		18.0	30.0
87-88.99	16.7	11.54	16.98		10.0	16.0
89-90.99	16.7	7.7	9.43	(1)	16.0	20.0
91-92.99	20.0	1.9	—		4.0	2.0
93-94.99	—	1.9	1.89		4.0	4.0
Aver. Menton-Nasion Height.	12.18	12.09	12.04	(12.6)	12.35	12.34
Aver. Diam. Bizygom. Max.	14.05	14.18	14.17	(14.0)	14.45	14.25
Aver. Lower Facial Index.	86.6	85.3	84.97	(90.0)	85.52	86.6

	NASAL INDEX (<i>Males</i>)					
	OPATAS	YAQUIS	MAYOS	SERIS	PIMAS	PAPAGOS
	(31)	(52)	(53)	(1)	(53)	(50)
Average	81.1	78.96	80.24	(71.9)	78.067	79.85

MEASUREMENTS OF A SERI AT HERMOSILLO, SONORA

Name, Fernando.

Age, about 70.

Physical condition, fair ; no deformation.

Height, 170.7 cm.

Head: diam. antero-posterior max., 18.7 cm.

diam. lateral max., 15.2 cm.

height, biauricular line to bregma, 13.1 cm.

Face: menton-nasion height, 12.6 cm.

menton-crinion height 19.5 cm.

diam. bizygom. max., 14.0 cm.

diam. frontal minim., 10.0 cm.

diam. bigonial, 10.2 cm.

nose, height to nasion, 6 cm.

nose, breadth max., 4.35 cm.

mouth, width, 6.1 cm.

Nose moderately convex, septum horizontal. Forehead but slightly sloping ; supraorbital ridges, malars, and alveolar prognathism quite prominent.

YAQUI SKULLS (*Male*)

DEFORMATION	CALVARIUM			FACE				ORBITS			NASAL APERTURE		
	Diam. antero- post-max.	Diam. lateral max.	Cephalic Index	Height, Nasion to Bregma	Menton- nasion Height	Diam. bizyg. max.	Index	Mean Height	Mean Breadth	Mean Index	Height	Breadth max.	Index
1.	18.05	13.65	73.78	13.4	12.4	13.25	93.58	3.3	3.9	84.62	5.2	2.85	54.81
2.	18.1	13.6	75.14	14.8	12.9	14.65	88.06	3.8	4.3	88.37	5.2	2.6	50.0
3.	18.3	13.7	74.86	13.9	11.9	13.85	85.92	3.55	3.9	91.02	4.95	2.75	55.56
4.	17.8	12.95	72.75	13.7	12.4	13.4	92.54	3.75	4.05	92.6	5.35	2.6	48.6
5.	17.3	14.0	80.92	14.4	13.0	13.9	93.53	3.75	4.0	93.75	5.5	2.65	48.18
6. Slight occipital compression.	(17.0)	(14.25)	—	(14.35)	?	13.3	—	3.7	4.0	92.50	5.05	2.25	44.55
7.	18.6	13.7	73.66	13.4	11.3	14.0	80.71	3.4	4.0	85.0	5.5	2.95	53.64
8.	18.1	13.4	74.03	14.2	11.8	13.4	88.06	3.3	3.85	85.73	4.7	2.75	58.51
9.	17.9	13.9	77.65	13.4	12.4	13.3	93.23	3.4	3.95	86.09	5.3	2.65	50.0
10.	17.7	13.4	75.71	13.8	12.3	13.4	91.79	3.4	4.0	85.0	5.2	2.65	50.96
11.	18.0	14.0	77.78	14.5	12.3	?	—	3.5	4.05	86.43	5.3	2.2	41.51
12.	17.5	13.4	76.57	13.6	12.9	14.15	91.17	3.5	4.05	86.43	5.4	2.55	47.22

DANISH MUSEUMS OF ARCHEOLOGY

By GEORGE GRANT MACCURDY

The National Museum at Copenhagen is composed of two departments, each being in turn subdivided. The first department, under the direction of Dr Sophus Müller, consists of three divisions: (1) Danish Antiquities, (2) Ethnographic Collection, (3) Classical and Egyptian Archeology. The chief division is that of Danish antiquities. Dr Carl Neergaard is the curator. The curatorship of the Ethnographic collection is at present vacant. This is one of the oldest and finest collections of its kind in Europe. To it now belong many valuable specimens from the old Museum Wormianum. Little or no effort is being made to increase the Ethnographic collection, it being the policy of the institution to concentrate its energies especially on the collection of national antiquities. The division of Classical and Egyptian Archeology is under the immediate charge of Dr Blinkenberg, another of Dr Müller's colleagues.

Dr W. Møllerup is director of the second department of the National Museum, which, like the first, is composed of three divisions, namely: (1) Coins, etc., (2) Middle Ages, (3) Historical Museum of the Kings of Denmark in the "Rosenborg Slot."

Of the combined collections, the chief interest is centered in the Danish antiquities. As a people the Danes are proud of their prehistoric past. No country has a more fruitful field of research for the periods covered by that past, and no country has been more fortunate in the amount and character of the service rendered in the domain of its national archeology. The traditions of a past, made glorious by such names as Thomsen and Worsaae, are being upheld by Sophus Müller, the present director. To the excellence of the work done for almost a hundred years is largely due the widespread interest in archeology which has led to the enactment of laws for the protection of monuments, and the control and disposition of museum collections. The best of the megalithic and other

prehistoric monuments, including kitchenmiddens, to the number of four thousand, now belong to the state, having been either bought or received as gifts from the owners of the land on which they are situated.

In addition to the great collection at the national capital, already mentioned, there are ten provincial museums of archeology in Denmark. Seven of these are in Jutland, the largest being at Aarhus and one each in Fünen, Laaland, and Bornholm. Each provincial museum receives annually 1000 kroner (\$280.00) from the state. In return for this subsidy, the museums may be called upon at any time to relinquish important specimens that may be wanted for the national collection at Copenhagen; and the director of the national collection is *ex officio* advisory director of all the provincial museums. This museum system has been in force only since 1880, so that important specimens obtained by the various museums prior to that date can never be appropriated by the Copenhagen Museum.

Dr Müller was making his annual tour of the provincial museums last summer at the time of my visit to Denmark. He had notified two of his colleagues of my coming—Drs Neergaard and Sarauw, who received me most cordially. To them I am much indebted for special facilities and many courtesies. The collections had increased largely since my visit in 1897, and new discoveries are being made constantly. One of last year's principal finds, dating from the early Bronze age, had just been placed on exhibition. It is a solar representation and dates from about the year 1000 B. C. The sun's disk is mounted on a chariot and represented as being drawn by a horse. Both figures rest on the six-wheeled chariot. One side of the disk was covered with gold-leaf, much of which is still intact. The spiral ornament was first chiseled in the bronze and then the gold-leaf applied by means of strong pressure. The other side is ornamented with a similar pattern, but the gold-leaf is lacking. The two figures were cast, the interior of the horse being filled with a fine, argillaceous paste. The chariot is executed with the same skill as the figures it supports, the style of the whole being purely northern. The fragments were found about six inches beneath the surface in a marshy district called Trundholm (Zealand). There

is no evidence that the locality was covered by water when the object was left there. The latter seems to have been intentionally broken and injured. The pieces were scattered over an area of about four meters square, and, in the opinion of Dr Müller,¹ had been left there as a religious offering and not as a hidden treasure. Dr Sarauw has brought together an interesting collection to represent the various grains, chiefly wheat and barley, encased in the paste of which some of the Neolithic pottery is made. He has in preparation an important publication on this subject.

Summer being the season for field work, one is fortunate to find as many as two members of the museum staff in the city at the same time. The day after I left Copenhagen, a party was expected to return from exploration in Jutland, and Dr Neergaard was to proceed immediately to another part of that peninsula (Virring) and resume excavations at an extensive prehistoric cemetery, dating from the first to the third century, A. D. The locality has already yielded a large amount of valuable material. In regard to explorations, provincial museums are not allowed to excavate without a permit from the National Museum authorities, but they are, of course, reimbursed for such specimens as are relinquished in favor of the Copenhagen collection. While the system is, on the whole, very satisfactory, it is defective in so far as it tends to discourage competition among the various museums. There is no incentive to local pride, hence provincial treasures are seldom if ever augmented by gifts from private citizens.

Antiquities of gold and silver found in Denmark are treated as a class apart. They must become the property of the state, which pays the finder a sum equal to their intrinsic value, to which a small bonus is added. The bonus lessens the temptation to sell to another purchaser than the state, or even to melt down precious relics for the mere value of the metal they may contain. Thus has the National Museum succeeded in bringing together an almost unrivaled collection of gold and silver ornaments and utensils. These treasures, once in its possession, are guarded with the utmost care. In 1802 the collection was robbed of its most valued possession,

¹ *Nordiske Fortidsminder*, 1903, p. 322.

the two celebrated gold horns found in 1639 and 1734. The loss was all the more serious in view of the fact that no casts had been taken of the originals, the only record left being unsatisfactory drawings. Such a theft would be impossible now. The curator, in person, opens and closes each day the special cases in which gold and silver objects are displayed.

Objects in bronze are also much prized, because of their comparative rarity and archeological bearing. The Copenhagen Museum alone has enough material from which to write a fairly complete history of the Bronze age in northern Europe. One of the most attractive cases is that containing twenty-one large bronze trumpets (Lure). These were made in pairs suggesting the paired horns of an ox. Half a dozen of the best preserved trumpets needed only slight repairs to put them in condition for use. And what could be more appropriate than to make use of them in connection with the celebration of the National holiday! This is precisely what Dr Müller has decided to do, the first annual concert having taken place on the 24th of last June.¹ This, it may be remembered, is the Feast of St John, supposed by some to be a relic of Baal worship, and still quite generally observed in the countries of Europe. While on an archeological excursion in France (departments of Indre-et-Loire and Dordogne), last June and July, my attention was attracted to evidences of numerous recent bonfires at crossroads and other convenient meeting places. My companions, Frenchmen, informed me that these bonfires were lighted on the eve (June 23) of St John's Day. Door lintels were also decorated with flowers and twigs. The same custom is said to exist in England and Ireland. In Denmark it is the national holiday. Returning to the bronze trumpets, the playing last June was done by two musicians from the royal opera, the ceremony taking place on the 24th at high noon. The performers stood on the low, flat roof over the entrance to the Museum. They turned first toward the inner court and blew a blast; then faced the throng of 10,000 spectators, and played the National hymn, the performance lasting about twenty minutes.

¹ Two or three concerts had been given previously, but at longer intervals than one year.

The national antiquities were formerly housed in the "Kristiansborg Slot"; were there, in fact, when the theft of the gold horns took place. After a disastrous fire which practically destroyed the palace, the Danish antiquities were transferred to the adjoining "Prinsens Palais," which still serves as their repository. It is an old structure, not perfectly adapted to museum purposes, but the curators have made the most of their facilities. The labeling (in Danish only) is thorough and leaves nothing to be desired in point of execution. Foreigners not familiar with the Danish language may procure a very satisfactory catalogue in German (*Führer durch die Dänische Sammlung: Vorgeschichtliche Zeit*). An English catalogue is in preparation.

It is unfortunate that such a large and systematically arranged collection should not be made the basis of university instruction in the subject of national archeology, and that the author of such an excellent text-book as Müller's *Nordische Altertumskunde* should not occupy a professorship in the neighboring university. Worsaae used to offer a course gratis, but now there is only an occasional (free) lecture.

THE CHAMORRO LANGUAGE OF GUAM — III

By WILLIAM EDWIN SAFFORD

VII. — NUMERATION

I. ETYMOLOGY OF NUMERALS. — In the following table the first ten numerals of Chamorro are compared with languages of the Malay archipelago, the Philippines, the Island of Formosa, Melanesia, Polynesia, Madagascar, and Micronesia:

	ONE	TWO	THREE	FOUR	FIVE
Primitive roots. ¹	<i>sa, ta</i>	<i>rua, dua</i>	<i>tol, tel</i>	<i>fat, pat</i>	<i>lima</i>
Chamorro, Guam.	hacha	hu-gua	tulu, tulo	fatfat	lima
Pampango, Philippines.	<i>isa</i>	<i>a-dua</i>	<i>a-tlo</i>	<i>a-pat</i>	<i>lima</i>
Tagalog, “	<i>isá</i>	<i>dalaúá</i>	<i>tatló</i>	<i>apát</i>	<i>limà</i>
Modern Malayan.	<i>satu</i>	<i>duâ</i>	<i>tiga</i>	<i>ampat</i>	<i>lima</i>
Tsu, Formosa.	<i>chuni</i>	<i>lusa</i>	<i>tulu</i>	<i>supat</i>	<i>lima</i>
Tsuihoan, Formosa.	<i>taha</i>	<i>tusha</i>	<i>turu</i>	<i>spat</i>	<i>hrima</i>
Sekhoan, “	<i>adadumat</i>	<i>dusa</i>	<i>turu</i>	<i>supat</i>	<i>hasub</i>
Tayal, “	<i>kotock</i>	<i>sajin</i>	<i>shugal</i>	<i>päiat</i>	<i>magal</i>
Ulawa, Solomon Ids.	<i>e ta</i>	<i>e rua</i>	<i>e'olu</i>	<i>e hai</i>	<i>e lima</i>
Fiji.	<i>e dua</i>	<i>e rua</i>	<i>e tolu</i>	<i>e va</i>	<i>e lima</i>
Samoa.	<i>e tasi</i>	<i>e lua</i>	<i>e tolu</i>	<i>e fa</i>	<i>e lima</i>
Hawaii.	<i>a kahi</i>	<i>a lua</i>	<i>a kolu</i>	<i>a ha</i>	<i>a lima</i>
Easter Id.	<i>ka tahi</i>	<i>ka rua</i>	<i>ka toru</i>	<i>ka ha</i>	<i>ka rima</i>
Maori, New Zealand.	<i>tahi</i>	<i>e rua</i>	<i>e toru</i>	<i>e wha</i>	<i>e rima</i>
Madagascar.	<i>isa</i>	<i>roa</i>	<i>telo</i>	<i>efatra</i>	<i>dimy</i>
Yap, Caroline Ids.	<i>rep, leb</i>	<i>ru</i>	<i>thaleb</i>	<i>eninger</i>	<i>lahl</i>
Radack, Marshall Ids.	<i>duon</i>	<i>ruo</i>	<i>dillu</i>	<i>emmen</i>	<i>lallim</i>

In the above examples, with the exception of the Tayal, which is spoken by the aborigines inhabiting the mountain districts of northern Formosa, and the languages of Yap and Radack, which are classed as Micronesian, a wonderful correspondence will be seen. Practically the same system of numeration is used by natives of islands distributed from the north temperate to the south temperate zone of the Pacific ocean, and from Madagascar, off the east coast of Africa, to Easter island, which is situated in 109° 30' west longitude, almost on the meridian which separates Colorado and Utah.

¹ The primitive roots are selected from the languages of the primitive inhabitants of the Malay archipelago. See Wallace, *The Malay Archipelago*, New York, 1869, pp. 624-5.

The Chamorro, like the greater number of these languages, has a purely decimal system ; in the neighboring Micronesian islands and in several of the languages spoken in Formosa this is not the case. Thus, in Yap *seven* is designated by 'six-and-one,' *eight* by 'six-and-two,' *nine* by 'six-and-three' ; in Radack, of the Marshall group, *six* is expressed by 'three-three,' *seven* by 'three-three-and-one' ; *eight* by 'double-four,' *nine* by 'double-four-and-one' ; in Formosa the Tsu language, spoken by the inhabitants of the

	SIX	SEVEN	EIGHT	NINE	TEN
Primitive roots.	<i>un, an, on</i>	<i>fitu, pitu</i>	<i>walu</i>	<i>siwa, sio</i>	<i>pulu, hutu</i>
Chamorro, Guam.	gunum	fiti	gualu	sigua	manot
Pampango, P. I.	<i>anam</i>	<i>pitu</i>	<i>valo</i>	<i>siam</i>	<i>a-pulo</i>
Tagalog, P. I.	<i>anim</i>	<i>pitó</i>	<i>ualó</i>	<i>siyam</i>	<i>sang-pouó</i>
Modern Malayan.	<i>anam</i>	<i>tujuh</i>	<i>delâpan</i>	<i>sembilan</i>	<i>sa-pulo</i>
Tsu, Formosa.	<i>nomi</i>	<i>pitu</i>	<i>mevaru</i>	<i>sio</i>	<i>massiki</i>
Tsuihoan, Formosa.	<i>sturu</i>	<i>pitu</i>	<i>kaspát</i>	<i>tamaro</i>	<i>maksin</i>
Sekhoan, "	<i>hasubudá</i>	<i>hasubidusa</i>	<i>hasubituru</i>	<i>hasubisupát</i>	<i>issit</i>
Tayal, "	<i>taío</i>	<i>pitu</i>	<i>s'pattle</i>	<i>taí-so</i>	<i>mu-po, pong</i>
Ulawa, Solomon I.	<i>e ono</i>	<i>e hi'u</i>	<i>e walu</i>	<i>e siwa</i>	<i>ta-nga-hulu</i>
Fiji.	<i>e ono</i>	<i>e vitu</i>	<i>e walu</i>	<i>e thiwa</i>	<i>e tini</i>
Samoa.	<i>e ono</i>	<i>e fitu</i>	<i>e valu</i>	<i>e iwa</i>	<i>e se-fulu</i>
Hawaii.	<i>a ono</i>	<i>a hiku</i>	<i>a walu</i>	<i>a iwa</i>	<i>umi</i>
Easter Id.	<i>ka ono</i>	<i>ka hitu</i>	<i>ka varu</i>	<i>ka iwa</i>	<i>a-nga-huru</i>
Maori, New Zeal'd.	<i>e ono</i>	<i>e whitu</i>	<i>e waru</i>	<i>e iwa</i>	<i>tekanu</i>
Madagascar.	<i>enina</i>	<i>fito</i>	<i>valo</i>	<i>sivy</i>	<i>folo</i>
Yap, Caroline I.	<i>nel</i>	<i>me-de-lip</i>	<i>me-rug</i>	<i>me-reb</i>	<i>ragath</i>
Radack, Marshall I.	<i>dildinnu</i>	<i>dildimem-duon</i>	<i>cidinnu</i>	<i>eidinem-duon</i>	<i>chabujet</i>

mountains southwest of Nitakayama, has a decimal system of numerals in nearly all of which the primitive Malayan roots can be recognized ; in the Tsuihoan language, spoken in the vicinity of Lake Candidius (Sui-shako), *six* is expressed by 'double-three' and *eight* by 'double-four' ; in the Sekhoan language, spoken by the "tame savages" living on the mountain spurs east of Shoka (Chang-wha), *six* is expressed by 'five-and-one,' *seven* by 'five-and-two,' etc.; and in the Tayal, or Atayal, scarcely any of the primitive Malayan roots can be recognized except *pitu* (seven), and perhaps *païat* (four) and *s'pattle* (double-four, or eight).

The languages of Formosa are here mentioned to show how the systems of numeration serve to distinguish the aboriginal tribes from the more recent Malayan intruders.

The Chamorro numeral system is no longer used in Guam, but a few of the numerals are retained in derived words; thus, from *hugua*, two, we have *huguayon*, two-handed (ambidextrous); from *maisa*, one (used in counting persons), we have *mamaisa*, to be alone, a single one.

2. CARDINAL NUMBERS. — The forms of the cardinal numbers in Chamorro differ according to the nature of the objects counted. Days, months, and years are counted by the simple numerals; measurements are expressed by numerals with the prefix *tak* or *tag*; in counting living things there is a certain tendency to reduplication; in counting inanimate objects there is a suffix appended to the numerals. Examples:

1. SIMPLE NUMERALS FOR TIME IN ANSWER TO <i>fia</i> ?	2. NUMERALS FOR LIVING THINGS IN ANSWER TO <i>fafia</i> ?	3. NUMERALS FOR MEASUREMENTS IN ANSWER TO <i>takfia</i> ?	4. NUMERALS FOR INANIMATE THINGS IN ANSWER TO <i>fiyai</i> ?
1. <i>hacha</i>	<i>maisa</i>	<i>takhachun</i>	<i>hachiyai</i>
2. <i>hugua</i>	<i>hugua</i>	<i>takhuguan</i>	<i>huguiyai</i>
3. <i>tulo, tulu</i>	<i>tato</i>	<i>taktulun</i>	<i>tolgiyai</i>
4. <i>fatfat</i>	<i>fatfat</i>	<i>takfatun</i>	<i>farfatai</i>
5. <i>lima</i>	<i>lalima</i>	<i>takliman</i>	<i>limiyai</i>
6. <i>gunum</i>	<i>guagunum</i>	<i>takgunum</i>	<i>gonmiyai</i>
7. <i>fiti</i>	<i>fafiti</i>	<i>takfitun</i>	<i>fetguiyai</i>
8. <i>gualu</i>	<i>guagualu</i>	<i>takgualun</i>	<i>gualgiyai</i>
9. <i>sigua</i>	<i>sasigua</i>	<i>taksiguan</i>	<i>siguiyai</i>
10. <i>manot</i>	<i>mañnot</i>	<i>takmaonton</i>	<i>manutai</i>
20. <i>hugua nga fulu</i>	<i>hugua nga fulu</i>	<i>takhugua nga fulu</i>	<i>huguiyai nga fulu</i>
30. <i>tulu nga fulu</i>	<i>tato nga fulu</i>	<i>taktulu nga fulu</i>	<i>tolgiyai nga fulu</i>
40. <i>fatfat nga fulu</i>	<i>fatfat nga fulu</i>	<i>takfatu nga fulu</i>	<i>farfatai nga fulu</i>
100. <i>gatus</i>	<i>gatus</i>	<i>manapo</i>	<i>gatus</i>
1,000. <i>chalan</i>	<i>chalan</i>	<i>takchalan</i>	<i>chalan</i>

The method of prefixing syllables or particles to the numerals is common to nearly all the languages in which this system is used. Thus we have in Hawaii, for one, *akahi* or *ekahi*; for two, *alua* or *elua*, etc.; in Samoa, *e tasi*, *e lua*, *e tolu*, etc.; in Easter island, *ka tahi*, *ka rua*, *ka toru*.

Numerals prefixed to spans, indicating measure of length, have the prefix *tak* and are followed by the unit *hinfantifi*:

One span, *takhachun nga hinfantifi* (a quarter of a yard).

Two spans, *takuguan nga hinfantifi* (half a yard).

Numerals indicating finger-breadths are of the form used for inanimate objects and are preceded by the unit *hemlum*:

One finger-breadth, *hemlum hachiyai*.
Two finger-breadths, *hemlum huguiyai*.

3. COMPOSITE NUMBERS. — The word for *eleven* signifies, in all probability, 'a set which has one'; *twelve*, 'a set which has two'; *twenty-one*, 'two tens which have one'; *twenty-five*, 'two tens which have five'; and so forth. The differences between the forms of numbers applied to animate and inanimate objects and to units of time and measurement are retained in the composite numbers. Examples :

NUMBERS USED IN COUNTING TIME	NUMBERS USED IN COUNTING INANIMATE THINGS
11. <i>manot nga guai hacha</i> ;	<i>manutai nga guai hachiyai</i> ;
12. <i>manot nga guai hugua</i> ;	<i>manutai nga guai huguiyai</i> ;
13. <i>manot nga guai tulo</i> ;	<i>manutai nga guai tolgiyai</i> ;
20. <i>hugua nga fulu</i> ;	<i>huguiyai nga fulu</i> ;
21. <i>hugua nga fulu nga guai hacha</i> ;	<i>huguiyai nga fulu nga guai hachiyai</i> ;
25. <i>hugua nga fulu nga guai lima</i> ;	<i>huguiyai nga fulu nga guai limiyai</i> ;
33. <i>tulo nga fulu nga guai tulo</i> ;	<i>tolgiyai nga fulu nga guai tolgiyai</i> ;
301. <i>tulo nga gatus nga guai hacha</i> ;	<i>tolgiyai nga gatus nga guai hachiyai</i> .
352. <i>tulo nga gatus nga guai lima nga fulu nga guai hugua</i> .	

NUMBERS USED IN COUNTING FATHOMS

- 11. *takmaonton nga guai takhachun* ;
- 22. *hugua nga fulu nga guai takhuguan* ;
- 110. *gatus nga guai takmaonton* .

NUMBERS USED IN COUNTING LIVING THINGS

- 11. *maonot nga guai maisa* .
- 13. *maonot nga guai tato* .
- 33. *tato nga fulu nga guai tato* .
- 305. *tato nga gatus nga guai lalima* .

4. THE CONNECTIVE PARTICLE OR "LIGATURE" *nga* OR *na*. — It has already been shown that attributive adjectives are connected with their substantives by a connective particle *na*. This was originally *nga* and corresponded to similar particles in the Philippine dialects and in some of the islands of the Malay archipelago, which have been called by Spanish grammarians "ligatures," or "liga-

tions," since they bind the adjective to the noun they qualify. It has also been shown that many words are used as nouns, adjectives, or verbs, according to the meaning to be expressed. When these words are used as qualifying adjectives they must be connected with their substantives by this ligature; thus we have *patgon na lahe*, 'young male,' or *lahe na patgon*, 'male child.' All numeral adjectives are connected with their substantives by this particle; and it appears in certain derived numbers; as *hugua nga fulu*, 'twenty'; *tulu nga fulu*, 'thirty'; *hugua nga gatus*, 'two hundred.' It is an interesting fact that when languages like the Polynesian and Melanesian, in which these connective particles do not normally occur, have adopted this system of numeration, the derived numerals usually retain the particle, though its nature is not understood. Thus, in Samoa, though we have no particle in *sefulu*, ten, and *lua-fulu*, twenty, the connective particle has held its own in *tolu-nga-fulu* (thirty), *fā-nga-fulu* (forty), *tolu-nga-lau* (three hundred), etc. In Fiji, though *tini* (signifying 'limit,' or 'goal') is used for ten, yet in forming multiples of ten we have *rua sa-nga-vulu*, (twenty), *tulu sa-nga-vulu* (thirty), *sa-nga-vulu* having signified in the original language whence it came 'one ten,' an expression customary in modern Malayan, Tagalog, and many other dialects. This form is well shown in the language of Ulawa of the Solomon group, where *ta* signifies 'one' and *ta-nga-hulu* 'ten,' or 'one ten.' In the Samoan *sefula*, *se* is the indefinite article. The survival of the particle *nga* throws valuable light on the origin of this system of numeration, showing conclusively that it is neither Melanesian nor Polynesian, but that it was borrowed from a language in which attributive adjectives were connected to their substantives by ligatures. Such languages are spoken in Guam, the Philippines, and in many of the islands of the Malay archipelago. With these languages as a basis for comparison, the interpolated syllables in the Polynesian and Melanesian dialects at once become intelligible and need not be accounted for, as having been used for the sake of euphony;¹ and the *sangavulu* of the Fijians, who do not express 'one' by *sa*, need not be interpreted as possibly meaning 'a double set of

¹ See Pratt, George E., *A Grammar and Dictionary of the Samoan Language*, 3d ed., London, 1893, p. 167.

fingers.'¹ The use of the ligature is demanded by the genius of the Chamorro language, so that it is usually expressed with the Spanish numerals. Thus we now say *uno na manog*, 'one fowl'; *dies na uhañg*, 'ten shrimps.'

In the composite numbers the second *nga* (or, as it is sometimes written, *na*) is the indefinite or descriptive relative particle. (See § 8, c, under *The Pronoun*.)

5. MANOT.—The word for 'ten' is *manot*, which may be considered as expressing 'a set.' When more than one ten is expressed, *fulu* is used. In Hawaii *mano* indicates 4,000, and is used alone or reduplicated to signify multitudinous. In Samoa *mano* signifies 10,000, or a myriad, the limit of Samoan counting.² In the Chamorro this is expressed by *manutu*.

6. FULU.—The origin of *fulu* is not known. As has been shown in the table, its use to express the number 10 is common to the Polynesian, the Malayan, the Melanesian, and the language of Madagascar. Fornander identifies it with the Polynesian word for 'feathers, hair, wool,'³ which is *pulu*, *fulu*, *hulu*, or *huru*; but I think that this is a mistake. In Guam we have both *pulu*, meaning 'hair' or 'feather,' and *fulu* meaning 'ten' for all numbers between twenty and ninety.

7. GATUS.—This word is also used for 'hundred' in the Bisayan and other Philippine dialects. In the Ilocana it is *gasut*, in Malayan *ratus*, and in the Malagasy *zàto*. It is possible that the Samoan *atu*, signifying a 'row, line, chain, or series,' as houses, mountains, islands, may have the same origin.

8. CHALAN.—This word, used in the Chamorro to express 'thousand,' becomes *dalan* in the Pampango and *dáan* in the Tagalog of the Philippines, and is in those dialects used to express 'hundred.' In the Tagalog the word for 'thousand' is *libo*; this becomes *ribu* in Malayan, *arivo* in the Malagasy, and in Hawaiian

¹ "It is possible to explain *sagavulu* in Fiji, *sanavul*, *hanavulu*, or whatever form the word may take in Melanesia. The word *vulu* may be shown to mean probably a set of fingers, and *saga* (*sanga*) double; if this be so, *sangavulu* corresponds to the Nengone *rewé tubenine*, two sets of fingers." — Codrington, R. H., *The Melanesian Languages*, Oxford, 1885, p. 247.

² Pratt, op. cit., pp. 9, 208.

³ Fornander, A., *An Account of the Polynesian Race*, 2nd ed., Lond., 1890, I, 156.

lehu, signifying in the last case 400,000, the highest number known to the Hawaiians.

9. METHODS OF COUNTING. — We have already seen (under *Interrogative Adjectives*, § 5) that in asking questions as to number or quantity the interrogative must correspond to the form of the numeral to be used in the answer. This may be regarded in the same light as the English expressions ‘How many head of cattle?’ ‘How many fathoms of rope?’ ‘How many dozen of eggs?’

In Chamorro, days, months, and years are counted by the simple cardinal numbers, as—

hacha nga puenge, one day (literally ‘one night’);
hugua nga pulan, two moons, two months;
tulo nga sakan, three harvests, three years.

The simple cardinals are used to express past time. In expressing future time, in answer to such a question as ‘When will he come?’ the ancient Chamorros would say:

<i>agupa</i> , tomorrow;	<i>i gunma</i> , in six days;
<i>i hacha</i> , day after tomorrow;	<i>i fitgua</i> , in seven days;
<i>i telgua</i> , in three days from now;	<i>i gualgua</i> , in eight days;
<i>i fata</i> , in four days;	<i>i siguiya</i> , in nine days;
<i>i limiya</i> , in five days;	<i>i manot</i> , in ten days.

Fishermen count from three on with the numerals used for living things: *Fafia nga guihan sinipegmo?* How many fish have you caught?

<i>hatitip</i> , one;	<i>fatfat</i> , four;
<i>atsgan</i> , a pair;	<i>lalima</i> , five;
<i>tato</i> , three;	<i>guagunum</i> , six.

Fish are also counted in pairs:

<i>atsgan</i> , one pair;	<i>huguan maisa</i> , a pair and a half;
<i>hugua nga atsgan</i> , two pairs;	<i>tulum maisa</i> , two pairs and a half;
<i>tulo nga atsgan</i> , three pairs;	<i>i usan</i> , ten pairs;
<i>hugua nga i usan</i> , twenty pairs;	
<i>i usan nga guai hatitip</i> , ten pairs and a half;	
<i>gatus nga i usan nga guai hatitip</i> , a hundred pairs and a half.	

In asking the length of a boat, the ancient Chamorros would say:

Takfian yini nga sagman ? How long is this canoe ?

Takhachun, takhuguan, etc. One fathom long, two fathoms long, etc.

10. ORDINAL NUMBERS. — The Chamorro ordinals are as follow :

i fina mona, imena, the first ; *i fina haunum*, the sixth ;

i fina hagua, the second ; *i fina hauti*, the seventh ;

i fina hatu, the third ; *i fina haulu*, the eight ;

i fina hafat, the fourth ; *i fina hasgua*, the ninth ;

i fina halma, the fifth ; *i fina hanut*, the tenth.

i fina hanut nga guai maisa (in counting living things), the eleventh ;

i fina hanut nga guai hacha (in counting time), the eleventh ;

i fina hanut nga guai hachiyai (in counting things), the eleventh.

Mona, or *fona*, signifies foremost, or front : from it we have *gi mena*, in front of, or opposite to ; *finénana*, the first ; *finénana na patgon*, first-born child.

In the same way we have *talo*, middle, mid ; *tate*, last or rear ; from which we have *kálolot talo*, middle finger ; *taloane*, noon, mid-day ; *tátalopueñge*, midnight ; *tátate*, hindmost, posterior.

11. DISTRIBUTIVE NUMBERS. — The particle *um* is inserted before the first vowel of the numeral, reduplicating at times the first or second syllable ; for example —

<i>hatitip</i> , one ;	<i>umatitip</i> , one by one, or one at a time ;
<i>hugua</i> , two ;	<i>humugua</i> , two by two, or two at a time ;
<i>maisa</i> , one ;	<i>mumaisa</i> , one by one, or one at a time ;
<i>hugiyai</i> , two ;	<i>humugiyai</i> , two by two, or two at a time.

The following are examples :

WITH HACHA	WITH MAISA	WITH HACHIJAI	
1. <i>humachu</i>	<i>mumaisa</i>	<i>humachiyai</i>	one by one
2. <i>humugua</i>	<i>humalgua</i>	<i>humugiyai</i>	two by two
3. <i>tumulo</i>	<i>tumato</i>	<i>tumelgiyai</i>	three by three
4. <i>fumatfat</i>	<i>fumafat</i>	<i>fumatfatai</i>	four by four
5. <i>lumima</i>	<i>lumalima</i>	<i>lumimiyai</i>	five by five
6. <i>gumunum</i>	<i>gumagunum</i>	<i>gumonmiyai</i>	six by six
7. <i>fumiti</i>	<i>fumafiti</i>	<i>fumitgiyai</i>	seven by seven
8. <i>gumalo</i>	<i>gumagualo</i>	<i>gumalguiyai</i>	eight by eight
9. <i>sumigua</i>	<i>sumasigua</i>	<i>sumigiyai</i>	nine by nine
10. <i>mumanot</i>	<i>mumaonot</i>	<i>mumanutai</i>	ten by ten

12. NUMERAL ADVERBS. — These are formed in most cases by prefixing the particle *faha* and abbreviating the primitive numeral :

HOW MANY TIMES?

FAHAFA?

<i>lacha</i> , once ;	<i>fahaunum</i> , six times ;
<i>fahagua</i> , twice ;	<i>fahauti</i> , seven times ;
<i>fafatu</i> , three times ;	<i>fahaulu</i> , eight times ;
<i>fahafat</i> , four times ;	<i>fahasgua</i> , nine times ;
<i>fahalna</i> , five times ;	<i>fahanot</i> , ten times ;
<i>fahanot nga guai lacha</i> , eleven times ;	
<i>fahanot nga guai fahagua</i> , twelve times ;	
<i>hugua nga fulu nga guai lacha</i> , twenty-one times ;	
<i>tulu nga fulu nga guai fahagua</i> , thirty-two times ;	

13. THE CHAMORRO CALENDAR. — The year was divided into thirteen moons, and the time was reckoned from harvest to harvest. The name for year, *sakan*, signifies 'harvest.' As in Samoa some months were named from a certain marine annelid, which appears each year at the same time,¹ so in Guam two of the months were named for fishing seasons: *Umatalaf*, corresponding to the month of March, and signifying 'to go to catch guatafi,' a kind of fish; and *Umagahaf*, the moon between December and January, signifying 'to go crayfishing.' *Mananaf*, or *Fananaf*, corresponding to June, is supposed to signify 'crawling time,' or 'to go on all fours'; but it is not understood how this name should apply to it. *Tenhos*, the month of August, signifying 'angry,' or 'out of patience,' is well named, as the weather then is unsettled, and the steady trade-wind of the good season ceases and is replaced by variable winds from the south and southwest. The September moon is appropriately called *Lamlam*, or *Lumamlam*, signifying 'lightning.' The October moon was named *Fagualu*, or *Fagualo*, 'planting time,' for it was then that the Chamorros planted their rice. The November moon was called *Sumongsung*, meaning 'to put in the stopper,' an expression probably meaning that the hard rains had ceased. Following is a list of the Chamorro names of the moons:

- | | |
|----------------------------------|------------------------------|
| 1. <i>Tumeiguini</i> , January ; | 3. <i>Umatalaf</i> , March ; |
| 2. <i>Maimo</i> , February ; | 4. <i>Lumuhu</i> , April ; |

¹ This little animal, *Palola viridis*, appears in the openings of the coral reefs for only a few hours on the morning after the third quartering of the October and of the November moons, swarming in great numbers on the surface, where it is scooped up by the natives, who know just when to expect it. It resembles vermicelli in appearance, and is much relished by the Samoans. The first two months of the palolo half-year are named *Palolomua*, or 'First of Palolo,' and *Palolomuli*, or 'After Palolo.'

5. *Magmamao*, May ; 9. *Lumamlam*, *Lamlam*, September ;
 6. *Mananaf*, *Fananaf*, June ; 10. *Fagualu*, *Fagualo*, October ;
 7. *Semo*, July ; 11. *Sumongsung*, November ;
 8. *Tenhos*, August ; 12. *Umayañggan*, December ;
 13. *Umagáhaf*, *Omagáhaf*.

14. MODERN NUMERALS.—These have been derived from the Spanish. The primitive words in some cases have been modified, the *z* of *diez* changing to *s*, the *e* of *seis* to *a*, and *v* to *b*, in accordance with Chamorro pronunciation.

Cardinal Numbers

	SPANISH	CHAMORRO	ENGLISH
1,	un, uno, una,	<i>un, uno,</i>	one.
2,	dos,	<i>dos,</i>	two.
3,	tres,	<i>tres,</i>	three.
4,	cuatro,	<i>kuatro,¹</i>	four.
5,	cinco,	<i>sinko,</i>	five.
6,	seis,	<i>sais,</i>	six.
7,	siete,	<i>siete,</i>	seven.
8,	ocho,	<i>ocho,</i>	eight.
9,	nueve	<i>nucbe,</i>	nine.
10,	diez,	<i>dies,</i>	ten.
11,	once,	<i>onse,</i>	eleven.
12,	doce,	<i>dose,</i>	twelve.
13,	trece,	<i>trese,</i>	thirteen.
14,	catorce,	<i>katorse,</i>	fourteen.
15,	quince,	<i>kinse,</i>	fifteen.
16,	diez y seis,	<i>diesisais,</i>	sixteen.
17,	diez y siete,	<i>diesisiete,</i>	seventeen.
20,	veinte,	<i>bente,</i>	twenty.
30,	treinta,	<i>trenta,</i>	thirty.
100,	ciento,	<i>siento,</i>	hundred.
1,000,	mil,	<i>mil,</i>	thousand.
1,000,000,	millon,	<i>miyon,</i>	million.

Modern Ordinals

PRIMITIVE WORD	CHAMORRO	ENGLISH
fono (front, foremost),	<i>i finenana,</i>	the first.
dos,	<i>i mina dos,</i>	the second.
tres,	<i>i mina tres,</i>	the third.

¹ The use of *k* instead of hard *c* is explained in vol. v, p. 295 (p. 7 of reprint).

From the above examples it will be seen that, with the exception of *finenana*, first, the ordinals are formed by adding the cardinals to the word *mina*. Thus, in giving the ten commandments, we have, *I mina sinko : muñga mamuno*, 'Fifth : thou shalt not kill' ; *I mina siete : muñga mañake*, 'Seventh : thou shalt not steal.'

Instead of these the Spanish ordinals are also used, *primero*, *segundo*, *tetsero*, etc., modified to accord with Chamorro pronunciation.

Distributives

These are now expressed by the particles *fan-a-* prefixed to the cardinal numbers ; as, *fan-askino nu i ägâ*, distribute the bananas five-by-five. In the indicative, past and present this becomes *man-a-* ; as *man-acuácuatro hulo*, they were coming up four-by-four ; *ufan-adiedies magi*, they will come hither ten-by-ten. Thus the numerals become verbs and are conjugated accordingly.

The Ligature na. — The ligature *na*, derived from the ancient *nga*, is used with the cardinal numbers when they are used adjectively ; as *bente na guihan*, twenty fishes ; *dies na uhañg*, ten shrimp. This may be omitted. If it is omitted with the numeral *uno* the ending *o* is omitted also ; as *uno na guihan*, but *un guihan*, one fish. As has been shown in discussing the article, the numeral *uno* never has the ending *a*, as in the case of the article before feminine nouns in Spanish. In the same way the ligature is used with the ordinals when used as adjectives ; as *mina sais na tinago*, sixth commandment. It may, however, be omitted. With Spanish ordinals it is used if they are not abbreviated, but if they omit the final vowel no ligation is used : *tetse ro natinago* (tercero mandamiento), but *tetset tinago* (tercer mandamiento).

VIII. — THE VERB

I. TRUE VERBS. — Almost any word in the Chamorro language may be used as a verb, but there are certain words expressing motion, condition, or action, which are essentially verbs in their primitive form. Examples :

<i>hanao</i> , go ; walk ;	<i>agañg</i> , call out ;	<i>hagô</i> , reach ;
<i>maila</i> , come ;	<i>fapos</i> , pass ;	<i>taga</i> , cut ;
<i>saga</i> , stay ;	<i>tunog</i> , descend ;	<i>tuge</i> , write ;
<i>falago</i> , run ;	<i>basnag</i> , fall ;	<i>taitai</i> , recite, read ;

<i>ason</i> , lie down ;	<i>fato</i> , arrive ;	<i>lii</i> , see ;
<i>omag</i> , bathe ;	<i>kano</i> , eat ;	<i>huñgog</i> , hear ;
<i>nañgo</i> , swim ;	<i>ginem</i> , drink ;	<i>pacha</i> , touch ;
<i>atog</i> , hide ;	<i>chogue</i> , work ;	<i>ñgiñge</i> , smell ;
<i>fato</i> , arrive ;	<i>fahan</i> , buy ;	<i>tamtam</i> , taste ;
<i>tañgis</i> , weep ;	<i>na'e</i> , give ;	<i>yute</i> , throw away ;
<i>chaleg</i> , laugh ;	<i>chule</i> , carry ;	<i>gote</i> , seize.
<i>ugong</i> , lament ;		

2. ABSENCE OF A COPULATIVE. — There is no copulative verb *to be*, the Chamorro language in this respect resembling the Hebrew. On this account there arises the necessity of denominative verbs, which are formed from names either substantive or adjective. Thus, when used predicatively, *tata*, 'father,' may be considered as a verb 'to be a father'; *mauleg*, 'good,' as a verb 'to be good'; *malango*, 'ill,' as a verb 'to be ill,' or 'to become ill.'

When the verb *to be* implies position, corresponding to the Italian *stare* and the Spanish *estar*, it is translated into the Chamorro by *gaige*; as, *gaige gi lancho*, 'he is at the ranch.' In this case the verb cannot be regarded as copulative.

The impersonal phrase 'there is' (French *il y a*, Spanish *hay*) is translated by *guaha*, as *guaha hānom*, 'there is water.'

3. DENOMINATIVE VERBS. — These verbs, which in their primitive sense are nouns or adjectives, are conjugated by particles and undergo reduplication, as in the case of intransitive or neuter verbs. They are used to express the identity, state, dignity, or office of an individual, or the substance, condition, attribute, or nature of a thing.

ROOT	USE AS DENOMINATIVE VERB
<i>tata</i> , father ;	<i>Tata yô</i> , I am a father.
<i>tata</i> , father ;	<i>Tumata yô</i> , I was a father.
<i>gaga</i> , animal ;	<i>Gaga i hilitai</i> , The iguana is an animal.
<i>magalahe</i> , governor ;	<i>Mumagalahe si Don Antonio</i> , Don Antonio was governor.
<i>malañgo</i> , sick ;	<i>Malañgo gui</i> , He is sick; <i>Manmalañgo siha</i> , They are sick.
<i>malañgo</i> , sick ;	<i>Umalango agupa</i> , He will be sick tomorrow.
<i>tata</i> , father ;	<i>Utata tiammam si Pedro</i> , Peter will soon be a father.

4. TRANSITIVE VERBS FORMED FROM NOUNS. — Just as in Eng-

lish we form a verb from the noun "box" or "bag," saying "Box the books," "The game is bagged," so in Chamorro transitive verbs are formed from nouns by adding to the primitive word *e* or *ye* :

ROOT	USED AS TRANSITIVE VERB
<i>kostat</i> , bag ;	<i>kostate i maeis</i> , bag the corn.
<i>kamuti</i> , sweet-potato ;	<i>kamutiye i guetta</i> , potato the garden.
<i>kottina</i> , curtain ;	<i>kottinaye i ältat</i> , curtain the altar.
<i>guma</i> , house ;	<i>magumae</i> , housed, to be built in houses.
<i>fâi</i> , rice ;	<i>mafaiye</i> , riced, to be planted in rice.
<i>tupu</i> , sugar-cane ;	<i>matupuye</i> , sugar-caned, to be planted in sugar-cane.
<i>hanom</i> , water ;	<i>mahanme</i> , watered, to be irrigated.
<i>chupa</i> , tobacco ;	<i>machupaye</i> , tobaccoed, to be planted in tobacco.
<i>maeis</i> , maize ;	<i>mamaeise</i> , corned, to be planted in corn.

These verbs follow the same rules as primitive verbs in forming the plural. Examples :

Matupuye i sesonyan. The swamp is planted in sugar-cane.

Manmatupuye i sesonyan siha. The swamps are planted in sugar-cane.

5. INTRANSITIVE VERBS FORMED FROM ADVERBS. — Examples :

<i>huyoñg</i> , outside ;	<i>Huyoñg !</i> Go out !	<i>Tafanhuyoñg</i> , Let us go out.
<i>halom</i> , in, inside ;	<i>Halom !</i> Come in !	<i>Tafanhalom</i> , Let us enter.
<i>hulo</i> , up, upward ;	<i>Kahulo !</i> Get up !	<i>Tafankahulo</i> , Let us rise.
<i>tate</i> , behind ;	<i>Tate !</i> Go behind !	<i>Tafanate</i> , Let us go behind.
<i>fona</i> , in front ;	<i>Fona !</i> Go ahead !	<i>Tafanmona</i> , Let us go ahead.
<i>halom</i> , within ;	<i>Humahalom hao ?</i> Do you believe ?	
<i>guse</i> , quickly ;	<i>Guse magi !</i> Hurry hither !	

6. PRONOUNS USED AS VERBS. — Certain pronouns may be used as intransitive or neuter verbs :

PRONOUN	VERB
<i>guaho</i> , I ;	<i>Guaguahohâ</i> , I am quite alone.
<i>hita</i> , we (incl.) ;	<i>Humihita guine</i> , We are here (together).
<i>hita</i> , we (incl.) ;	<i>Utahita guato</i> , We shall go there (together).

7. VERBAL PREFIXES. — Various meanings are conveyed by prefixing to the primitive verb certain particles. These prefixes are not confined to verbs but are applied to other parts of speech as well. They are quite distinct from verbal particles used to mark tense, mood, and person, and from the plural prefix applied to intransitive and passive verbs, adjectives, and certain nouns. Examples :

nâ-maãao, to cause fear, to make afraid, to terrify; from *maãao*, fear.
ma-poka, broken; from *poka*, break.

fan-lee, see (intransitive); from the transitive verb *lee*, see.

8. THE CAUSATIVE PREFIX *nâ*. — This particle when prefixed to a verb has the significance of 'to make to do' or 'cause to be.' As has already been shown it is also used as an adjectival prefix; *nâgasgas*, to make clean, or to cleanse, may be used as an attributive adjective signifying 'cleansing'; *nâmahô*, to cause thirst, may also be the adjective 'thirst-causing.' *Hanâbaba si Luis*, He made Louis crazy.

It may be prefixed to either an active or a passive verb; as —

hanâpunô, he caused to kill, he made some one kill something;

hanâmapunô, he caused to be killed, he had something or some one killed.

It has the effect of making certain intransitive verbs transitive:

INTRANSITIVE	TRANSITIVE
<i>Ason</i> , Lie down!	<i>nâason</i> , lay down, make lie down.
<i>Fatachoñg</i> , Sit down!	<i>nâfatachoñg</i> , set down, make sit down.
<i>Tunog</i> , Descend!	<i>nâtunog</i> , lower, cause to descend.
<i>Hanao</i> , Go!	<i>nâhanao</i> , cause to go, eliminate.

In the same way it converts adjectives into transitive verbs:

ADJECTIVE	TRANSITIVE VERB
<i>bula</i> , full;	<i>nâbula</i> , to fill.
<i>folgon</i> , wet;	<i>nâfolgon</i> , to wet or moisten.
<i>añglo</i> , dry;	<i>nâañglo</i> , to dry.
<i>homlo</i> , well;	<i>nâhomlo</i> , to cure, to make well.
<i>masa</i> , cooked;	<i>nâmasa</i> , to cook.
<i>maipe</i> , hot;	<i>nâmaipe</i> , to heat.
<i>oda</i> , dirty;	<i>nâoda</i> , to soil.
<i>káfache</i> , muddy;	<i>nâkáfache</i> , to muddy.

Combined with the particle *lá* it expresses a more modified effect:

<i>guse</i> , quick;	<i>nâláguse</i> , to shorten (in time).
<i>dikiki</i> , small;	<i>nâládikiki</i> , to lessen.
<i>guaguan</i> , dear (not cheap);	<i>nâláguguan</i> , to make dearer.
<i>tailaye</i> , bad;	<i>nâlátailaye</i> , to make worse.
<i>mauleg</i> , good;	<i>nâlámauleg</i> , to better.
<i>dididi</i> , little, few;	<i>nâládididi</i> , to diminish in quantity.

In the above examples the meaning is not necessarily to make a thing short or small or dear, but shorter, smaller, or dearer than before.

9. THE PREFIX OF CONDITION **ma**. — This prefix is also found in many adjectives expressing the nature or condition of a person or thing ; as, *mañaña*, soft ; *maneñgheñg*, cold ; *malañgo*, sick.

Prefixed to verbs it forms a word corresponding to the participle, but which should really be considered as an adjective. This adjective, like all others, can be used as a denominative, or attributive, verb, but such a verb is not really in the passive voice. For example, from *poka*, break, is formed *mapoka*, broken, an adjective used when the agent of the act is not designated. To express the passive voice the infix *in* must be used (*pineka*) if the agent is singular or dual ; the prefix *ma* is used only to express the passive voice if the agent is plural, as, *magote hao nu i mañelumo*, you were seized by your brothers ; but *ginete hao as Huan*, you were seized by John.

TRANSITIVE VERB

poka, break ;*titeg*, tear ;*tuno*, burn ;*gote*, seize ;

ADJECTIVE OF CONDITION

mapoka, broken ;*matiteg*, torn ;*matuno*, burnt ;*magote*, caught.

This prefix should not be confounded with the indicative prefix of certain intransitive verbs beginning with the syllable *fa*. These are probably derivatives and change the initial letter *f* to *m*, just as the imperative prefix *fan* of derived intransitives is changed to *man* in the indicative :

IMPERATIVE

Fatachong, Sit down !*Falag*, Run !*Faliñgo*, Lose !

INDICATIVE

Matachong yô, I sat down.*Malag yô*, I ran.*Maliñgo hao*, You lost.¹

10. *The Intransitive Prefix fan*. — This prefix, which in the indicative past and present tenses becomes **man**, must be added to a verb which is transitive in its primitive form if the verb has no object or if its object is not definitely indicated. It indicates spontaneity, or that the action is complete in itself, or that the verb has become intransitive. In the Chamorro language a verb with a vague or

¹ Similar modifications of the initial letter occur in all dialects of the Philippines and of Madagascar.

indefinite object is regarded as an intransitive verb. In the sentence *lii yuhe na modong*, Behold yonder ship! the transitive form is used, because the particular ship is indicated. In the expression *manlilii*, I see, the intransitive form is used because there is no object. In the sentence *manlilii pution*, I see a star, or I was seeing a star, the intransitive form is used, because the particular star is not indicated. The verb in the last case might be taken together with its object as an intransitive verb; 'I was star-seeing.'¹

11. ADVERBIAL PREFIXES. — Certain prefixes are used with verbs where in English an adverb or adverbial phrase would be used instead.

achá or **chá** signifies 'simultaneously,' 'equally,' or 'together with'; as, *hu-chágoté i táftafan yan i saligao*, I seized the rice-husks together with the centipede; *achábasnak si Adan yan Eva*, at the same time fell Adam with Eve; *chámalaño hao yan i chclumo*, you are sick equally with your brother; *chágilago gui yan tataña*, equally a Northman (Spaniard) is he with his father. In the latter cases *malaño* and *gilago* are denominative verbs.

katna signifies 'nearly' or 'almost': *katnahamatmos si Huan*, John nearly drowned, or John came near drowning; *katnamatai si Tata gi paiñge*, Father nearly died last night.

ké signifies 'to be about to,' 'to be on the point of': *k(um)ékahulo*, he was about to get up; *k(um)ékefalago*, he is about to run away; *k(um)éckemacgo*, he is on the point of falling asleep.

chat signifies 'badly' (Malayan *jahat*), 'not well, imperfectly, insufficiently, poorly, a little': *ha-chatgoté*, he seized badly, he took poor hold; *chatmalaté gui*, he is badly brought up; *chatmasaolag i patgon*, the child has been insufficiently whipped; *chatápaka i atgodon*, the cotton is not quite white; *chatmalago*, he ran little, he ran but poorly; *chatsulon*, he slipped a little, he slipped somewhat.

góf, **géf**, **gés** have the opposite significance of **chat**. They have the force of adverbs signifying 'well, thoroughly, properly, sufficiently'; as *gófmasaolag i patgon*, the boy was soundly

¹ In Fiji the same distinction is made between verbs having a definite and those having an indefinite object, as in the expressions 'to work *the* garden' and 'to work garden.' See Codrington, op. cit., p. 178.

whipped; *géfmalägo*, he ran well; *gésyayas yô*, I am completely tired out.

lá signifies 'further,' 'a little more'; as, *lábäbä i petta*, open the door wider; *látunog*, descend lower.

sen signifies 'entirely' or 'quite'; It is also used with adjectives and adverbs to express the superlative degree: *senyutê i hagas bidamo*, leave entirely your former life; *senápaka i mänog*, the chicken is pure white.

12. OTHER PREFIXES. — Certain other prefixes can be rendered in English only by phrases.

é or *ô*. — These prefixes form an intransitive verb signifying 'to go in quest of something', as *éguihan*, to go fishing; *ékuto*, to go nutting (*huto* is the name of the nuts of the dugdug — *Artocarpus*); (*um*)*égagao*, he goes about begging (*gagao*, to beg); (*um*)*ôfaesen*, he goes about inquiring.

én. — When prefixed to the name of an object of personal use, *en* forms an intransitive verb signifying to use conjointly or by turns: *uménigma si Luis yan Tomas*, Louis lived in the same house with Thomas; *uménlupes si Rosa yan Rita*, Rosa wears Rita's skirt by turns with her.

fâ. — This has two distinct significations. When prefixed to the name of something to eat it signifies 'to make into' or 'confection':

fâbuñuclos i dăgo, make into dumplings the yam;

ha-fâkarbon i abas, he made into charcoal the guava-wood.

Prefixed to the name of an office, occupation, a verb, or an adjective, it signifies 'to pretend to be,' 'to feign,' 'to play the part of,' or 'pass one's self off for':

ha-fâhatuñgo, he pretended to know.

ha-fâdokto gui, he pretended to be a doctor.

ha-fâtañga i guelôña, he passed his grandfather off as deaf.

ha-fâlahen Huan si Dolores i lahiña as Hosé, Dolores passed off as John's son the son of Joseph.

Exceptions. — To this rule the following exceptions may be noted: *fâbäbä*, signifies 'to make a fool of,' or 'to swindle.' *fâmaulcg*, signifies 'to make good,' 'to repair,' 'to benefit.' In order that they should signify 'to feign to be a fool,' 'to feign

to be good,' the *a*'s of *baba* should be pronounced like that in 'father,' and the *a* of *mauleg* should be modified to *ä*, writing the words *fâbaba*, *fâmäuleg*.

fâmä. — This particle is used very much like the preceding. In connection with food it signifies to make or to prepare something. Before the name of an office or dignity, or before an adjective, it signifies 'to feign' or 'to pretend.' In the indicative it becomes **mâmä**.

fâmäamotsa, get breakfast, prepare breakfast.

fâmäatmondigas ni i bäbue, make sausage out of the pig.

fâmäsindalo, play soldier, pretend to be a soldier.

fâmämaañao, pretend to be afraid.

fâmämalango, pretend to be sick.

Before other nouns it signifies to turn into, to be converted into ; as *mâmäääfог i ächo ñañac*, the coral stone turns into lime.

gê. — Prefixed to an adverb of place *gê* forms a verb signifying to put one's self into a certain position :

ADVERB

fonâ, in front ;

hulô, above ;

VERB

gêfena, put yourself forward ;

gêhilô, put yourself on top.

13. VERBAL SUFFIXES. — Another way of expressing various shades of meaning is by means of suffixes. Some of these take the place of prepositions, others have the effect of modifying adverbs.

-e, -ye, and -ge. — These, when suffixed to certain intransitive verbs, have the effect of directing the action toward some object. If the word ends in a consonant, or in a guttural vowel, the suffix is *e* ; if it ends in a simple vowel the suffix is *ye*, final *e* of the root being changed to *i* and final *o* to *u* ; and if the root ends in *ac*, the final *e* is suppressed.

If it ends in *ao* the final *o* is suppressed and suffix **ge** is added.

adiñgan, speak ;

sañgan, say ;

chule, carry ;

lôlô, caught ;

tola, spit ;

basnak, fall ;

adiñgane, speak to some one ;

sañgane, say to some one ;

chulie, carry to or for some one ;

lôlûe, cough at some one ;

tolâe, spit at some one ;

basnakge, fall upon some one.

Nafunhayane si tata nu i sapatos, Finish for father the shoes.

Tayuyute yô as Yuns, Pray for me to God.

Taitaye si guelamo un lebblo, Read to your grandmother a book.

<i>Sausage si nana nu i lamasa,</i>	Wipe off for mother the table.
<i>Tunoge si Luis,</i>	Lower for Louis.
<i>Chatage si Mariano,</i>	Be mean to Mariano.

When the same endings are suffixed to parts of the body, they form verbs signifying to turn toward or present the part of the body indicated; as *mataye*, to turn the eyes toward; *kalaguage*, to turn the side toward; *tatiye*, to turn the back.

Exceptions. — The last word signifies also ‘to follow behind’ a person. ‘To turn the face’ is *fana*.

The Suffix -hâ. — This indicates that an action is continued or habitual, as *machochôchôhâ*, he is working continually; *umôô-maghâ*, he is always bathing, he bathes all the time. With a pronoun it signifies ‘to be alone,’ as *guiyahâ*, he was alone; *guaguahohâ*, I am alone.

The Suffix -ñaehon — This suffix, appended to a verb or to the name of some article of apparel, signifies “to make use of,” “to use for a moment” :

<i>Huchachañaehon i tiherasmo,</i>	I used your scissors.
<i>Husapatosñaehon i iyomo,</i>	I used for a bit the shoes of yours.

Appended to a verb expressing momentaneous action it has the significance of depreciation :

<i>Huyeteñaehon i pakiña,</i>	I threw away (in disgust) his gun.
<i>Hafakaeñaehon gi manmalañgo,</i>	He divided away among the sick
<i>i salapiña</i>	his money.
<i>Mutañaehon,</i>	To vomit forth.

It sometimes is used to convey the meaning of “only a little,” or “a bit” :

<i>Panakñaehon,</i>	To whip but slightly.
<i>Balenñaehon i aposento,</i>	Brush up a little the alcove.
<i>Mafogñaehon,</i>	It was overturned by a slight touch.

With a reciprocal verb it signifies “by chance” :

Huasodâñaehon si Pedro, I happened to meet with Peter by chance.

14. REDUPLICATION. — Reduplication of the accented syllable of a verb in Chamorro has the effect of expressing sustained, continued, or suspended action. It makes indefinite the time of the completion of a verb’s action. Thus there are two imperatives.

The first, in which the verb has its simple form, is called the URGENT IMPERATIVE or DEFINITE IMPERATIVE. It expresses a command which is supposed to be executed forthwith. By reduplicating the accented syllable of the primitive verb the SUSPENDED IMPERATIVE or INDEFINITE IMPERATIVE is formed. It expresses a request or counsel which may be complied with at any time. In the same way the preterite, or past definite, is formed from the simple root, while the present imperfect, or copresent, which represents a progressive or continuous action, is formed from the reduplicated root. There are in the same way two futures, one definite and the other indefinite or lax, differing from each other only in the reduplication of the accented syllable.

Exception. — In verbs expressing mental acts reduplication has the effect of weakening the force of the verb ; as *hutungo*, I know ; *hutútungo*, I have an impression, I think I know.

In reduplicating the primitive word the tonic, or accented syllable, is usually doubled :

PRIMITIVE FORM	REDUPPLICATED FORM	
<i>ginem</i> ,	<i>gíginem</i> ,	drink.
<i>kano</i> ,	<i>kákano</i> ,	eat (transitive).
<i>chocho</i> ,	<i>chóchocho</i> ,	eat (intransitive).
<i>agang</i> ,	<i>áagang</i> ,	call, cry out.
<i>omag</i> ,	<i>óomag</i> ,	bathe, take a bath.
<i>lii</i> ,	<i>lílii</i> ,	see.
<i>taga</i>	<i>tátaga</i> ,	cut.
<i>talo</i> ,	<i>tátalo</i> ,	return.
<i>chule</i> ,	<i>chúchule</i> ,	carry.
<i>nâe</i> ,	<i>nânae</i> ,	give.
<i>lalatde</i> ,	<i>lálalatde</i> ,	blame.
<i>fato</i> ,	<i>fáfato</i> ,	arrive.

If in the tonic syllable of the root another letter follows the accented vowel, the last letter is omitted in reduplication. If the tonic syllable begins with two consonants, the first consonant is omitted in reduplication :

PRIMITIVE FORM	REDUPPLICATED FORM	
<i>tasme</i> ,	<i>tátasme</i> ,	sharpen.
<i>saolag</i> ,	<i>sasaolag</i> ,	whip.
<i>planta</i> ,	<i>plalanta</i> ,	place, plant.

If the primitive form be an intransitive verb derived from a transitive verb by prefixing the particle *fan*, the tonic syllable of the verb is reduplicated in its new form, as modified by the prefix. Thus, from *chule* (carry), is derived the intransitive verb *fañule*; from *taitai* (read, recite, or pray) is derived the intransitive verb *fanaitai*. In their reduplicated forms these verbs become *fañúñule*, *fanánaitai*:

ROOT	PRIMITIVE FORM	REDUPPLICATED FORM	
TRANSITIVE	INTRANSITIVE	INTRANSITIVE	
<i>chule,</i>	<i>fañule,</i>	<i>fañúñule,</i>	carry.
<i>taitai,</i>	<i>fanaitai,</i>	<i>fanánaitai,</i>	read.
<i>taga,</i>	<i>fanaga,</i>	<i>fanánaga,</i>	cut.
<i>lii,</i>	<i>fanlii,</i>	<i>fanlilii,</i>	see.
<i>fáhan,</i>	<i>famahan,</i>	<i>famámahan,</i>	buy.
<i>tuge,</i>	<i>fanuge,</i>	<i>fanúnuge,</i>	write.
<i>tuge,</i>	<i>fañge,</i>	<i>fáfañge,</i>	write.

If the verb is a passive derivative form by the infix *in*, the tonic syllable of the root is added without considering the particle, as *pinápak* (primitive form); *pinápanak* (reduplicated form): from the root *pának*, whip.

Certain verbs which have the form of derived transitive verbs reduplicate the tonic syllable like them. If the verb is composed of several words it is always the accented syllable which is reduplicated:

PRIMITIVE FORM	REDUPPLICATED FORM	
<i>fatáchong,</i>	<i>fatátachong,</i>	sit.
<i>famókat,</i>	<i>famómokat,</i>	go-on-foot.
<i>kahulo,</i>	<i>kahúhulo,</i>	rise, get up.
<i>falago,</i>	<i>falalago,</i>	go, run.
<i>falagisádog,</i>	<i>falagisásadog,</i>	go-to-the-river.
<i>falagihalomtáno,</i>	<i>falagihalomtátano,</i>	go-to-the-woods.

There are a few verbs which already have a reduplicated form. These do not further reduplicate their tonic syllable:

<i>kokolo,</i>	go up.
<i>totonog,</i>	go down.

15. TRANSITIVE AND INTRANSITIVE VERBS. — There are two

principal classes of verbs, between which a sharp distinction is made. To the first class belong TRANSITIVE VERBS HAVING A DEFINITE OBJECT ; as, *Taitai enao na lebblo!* Read that book! *Kano i äga*, Eat the banana.

In the second class are included INTRANSITIVE VERBS and TRANSITIVE VERBS WITH AN INDEFINITE OBJECT ; as, *Fanaitai!* Read! *Fanaitai lebblo siha*, Read books (the books not specified). *Chocho!* Eat! *Chocho aga*, Eat a banana.

Such verbs as express motion or condition or simple action are naturally intransitive and have primitive roots ; as, *hanao*, go ; *maila*, come ; *saga*, stay ; *tangis*, weep ; *nañgo*, swim ; *chaleg*, laugh.

Other verbs may have a transitive meaning or an intransitive meaning, and as transitive verbs they may have either a definitely indicated object or an indefinite object. In the latter class the intransitive forms are for the greater part derived from the definite transitive form, or root, by prefixing the particle **fan** to form the imperative. In the indicative mode this particle becomes **man**. It should not be confused with the plural prefix *man*. Like that particle it influences the initial consonants of the primitive root according to the same rule.¹

The relationship between the transitive verbs and their corresponding derived intransitives may be compared with that of the English transitives 'set' and 'lay' and their corresponding intransitives 'sit' and 'lie.' Sometimes the intransitive verb differs radically from its corresponding transitive, as in the above case of *chocho* and *kano* (to eat). These verbs may be likened to the English intransitive 'to talk' and the transitive 'to tell.' In the English expressions 'to talk sense,' 'to talk politics,' the verbs may be compared to the Chamorro transitives with an indefinite object, which resemble the intransitives. In such cases the phrases may be considered as a compound intransitive verb ; as, 'I read-books,' 'you eat-a-banana,' or 'I am book-reading,' 'he is corn-planting,' 'you are banana-eating,' which have a different sense from the verbs in which some particular book, corn, or banana is specified.

¹ See *American Anthropologist*, 1903, v, p. 303 (p. 15 of reprint).

DEFINITIVE TRANSITIVE	INDEFINITE TRANSITIVES OR INTRANSITIVES	
<i>kano,</i>	<i>chocho ;</i>	eat.
<i>lii,</i>	<i>fanlii ;</i>	see.
<i>fahan,</i>	<i>famahan ;</i>	buy.
<i>chule,</i>	<i>fañule ;</i>	carry.
<i>taga,</i>	<i>fanaga ;</i>	cut.
<i>tuge,</i>	<i>fanuge ;</i>	write.
<i>tuge,</i>	<i>fañgge ;</i> ¹	write.

¹ Irregular by contraction. In the same way we have *Mañgge*, Where is it? or, Where is he? contracted from *Mano nai gaige*.

[*To be continued*]

THE VOCABULARY OF THE CHINOOK LANGUAGE¹

By FRANZ BOAS

The following description of the vocabulary of the Chinook language is based on material collected by me near the mouth of Columbia river.² A discussion of the Chinook verb, also based on this material, has been published by Dr John R. Swanton.³ To this paper the reader is referred. The laborious compilations and comparisons required for the following notes were made partly by myself and partly by Dr Swanton, Mr William Jones, and Mr H. H. St. Clair 2d, to all of whom I wish to express my thanks for their assistance.

The stems of the Chinook language may be divided into two great classes, the one that appears generally independently, without affixes, the other which occurs only with pronominal prefixes. The first class comprises attribute complements, adjectives, adverbs, conjunctions, and interjections; the second includes nouns, pronouns, and verbs.

I. STEMS USED WITHOUT PRONOMINAL PREFIXES

1. ATTRIBUTE COMPLEMENTS. — It is one of the most striking characteristics of the Chinook language that a few verbs of very indefinite meaning which require subjective and objective attribute complements are applied with great frequency. By far the greater number of these, and the most characteristic ones, are words that do not require pronominal prefixes. Many are clearly of onomatopoeic origin. In some cases it appears doubtful whether the words belong to the regular vocabulary of the language or whether they are individual productions. This is true particularly when the words do not form part of the sentence, but appear rather as independent

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² F. Boas, *Chinook Texts*, Bulletin 20, Bureau of American Ethnology. F. Boas, *Kathlamet Texts*, Bulletin 26, Bureau of American Ethnology.

³ Morphology of the Chinook Verb, *American Anthropologist*, N. S., 11, pp. 199-237.

exclamations. Examples of this kind are the following : *oxuivā'yul kumm, kumm, kumm, kumm*, they danced, *kumm, kumm, kumm, kumm*, 167.5.¹ Here *kumm* indicates the noise of the feet of the dancers. *Hômm, iguā'nat ēnilā'kux, hômm*, I smell salmon, 67.3. *A'lta, pemm, temōtsgā'nuks gō iā'yacqL*, Now *pemm*, flies were about his mouth, 72.22. Here *pemm* indicates the noise made by flies. *Tcx, tcx, tcx, tcx, gō Lkamclā'leq*, there was noise of footsteps (*tcx*) on the sand, 75.3.

In a number of cases onomatopoetic terms which undoubtedly belong to the regular vocabulary are used in the same manner : *Tcxup, tcxup, tcxup, tcxup aLE'xax Lā'kēwax*, the torch flickered (literally : made *tcxup*), 50.24 ; *Ljäq, Ljäq, Ljäq, Lā'xa nē'xax iskē'epxoā*, out, out, out, out came a rabbit, 113.6. These cases make it plausible that most terms of this kind belong to the regular vocabulary. The frequent use of such onomatopoetic words and the occurrence of new words of the same kind, such as *tī'ntin* clock, watch, time ; *tsi'ktsik* wagon, suggest that in Chinook the power of forming new words by imitative sounds has been quite vigorous until recent times.

Examples of onomatopoetic words of this class are *hē'hē* to laugh, *hō'hō* to cough, *pō* to blow, *tjEq* to slap, *tjāk* to break a piece out, *tō'tō* to shake, *cix* to rattle, *cāu* low voice, *tsEx* to break, *tcxup* to flicker, *tcxoap* to gnaw, *kjut* to tear off, *xwē* to blow, *lep* to boil, *Ljäq* to crackle, *Ljlep* to go under water. It is difficult to say where, in this class of words, the purely onomatopoetic character ceases and where a more indirect representation of the verbal idea by sound begins. I think a distinct auditory image of the idea expressed is found in the following words : *iū'Ljl* proud, *wāx* to pour out, *pāl* full, *temE'n* clear, *tell* tired, *tcjpāk* loud, *gu'tgut* exhausted, *gE'cgec* to drive, *ku'lkul* light (of weight), *kjā* silent, *qjam* lazy, *qjul* fast, *lō'lō* round, *LEll* to disappear, *Lāx* to appear, *Lxoap* to dig.

Most stems of this class occur both single and doubled, sometimes they are even repeated three or four times. Repetition indicates frequency of occurrence of the verbal idea ; that is to say, it is dis-

¹ Figures appended to the examples given refer to the corresponding page and line in the *Chinook Texts* ; thus, 167.5 means that the preceding example will be found in line 5, page 167. An explanation of the alphabet used will be found in the Bulletin of the Bureau of American Ethnology and in Dr Swanton's paper above cited, pp. 200-202.

tributive, referring to each single occurrence of the idea.¹ We have *wāx* to pour out (blood) 68.1, *wāxwax* to pour out (roots) 43.2; *pō* to blow once 66.25, *pō'pō* to blow repeatedly 129.20; *tell* tired, *te'lltell* to be tired in all parts of the body; *kjut* to tear off 89.25, *kju'tkjut* to tear to pieces 249.4.

A few stems, however, occur in duplicated form only, probably on account of the character of the idea expressed which always implies repetition. Such are *hē'hē* to laugh, *hō'hō* to cough, *tō'tō* to shake, *gu'tgut* exhausted, *ku'lkul* light (of weight), *lōlō* round.

Others do not occur in duplicated form, but take the distributive ending *-ma*. These are *pāl* full 39.1, distributive *pālma* 229.24; *wukj* straight, real 24.12, distributive *wukjma* 107.20.

Still others do not seem to undergo any change for the distributive: *teme'n* clean, empty; *tā'menua* to give up 61.18; *tqjēx* to wish 129.27; *stāqj* war 272.5; *k'jē* to disappear, nothing; *kjwac* afraid 90.5; *Ljap* to find 140.1, 138.15. On the whole it would seem that those least onomatopoetic in character lack the doubled distributive.

In a few cases the doubled form has acquired a distinctive significance: *kjwan* hopeful 134.8, *kjwa'nkjwan* glad 38.20; *lāx* sideways 267.3, *lā'xlax* to deceive 65.19, to rock 129.2.

It is probable that all these words are capable of forming substantives or verbs containing pronominal elements. I have found the following examples:

<i>i-yuLj'l</i> pride 74.11,	from <i>yūLj'l</i> proud.
<i>tkjē'waxema</i> torches 27.22,	from <i>wax</i> light, to shine.
<i>ikjēwax</i> flower 165.27,	from <i>wax</i> to bloom.
<i>ēwaxō'mi</i> copper,	from <i>wax</i> light, to shine.
<i>ikjwacō'ō'mi</i> fear 213.10,	from <i>kjwac</i> afraid.
<i>ig'iLqjup</i> cut 46.2,	from <i>Lqjup</i> to cut.
<i>igē'LjMENLjMEN</i> syphilis,	from <i>LjMEN</i> soft, rotten.
<i>natsj'E'x</i> piece 69.3,	from <i>tsjEX</i> to tear.
<i>naLxou'p</i> hole 23.7,	from <i>Lxou'p</i> to dig.
<i>nalō'lō</i> something round,	from <i>lō'lō</i> round.
<i>-xā'pēnic</i> a woman gives herself in payment for services of a shaman	from <i>pā'nic</i> to give in payment for services of a shaman.
203.11,	

¹ Swanton, loc. cit., p. 233.

-gē'staqjoam to go to war 270.1,	from <i>staqi</i> war.
L-xqjam to be lazy,	from <i>qjam</i> lazy.
ne-āxaxome to notice 40.14,	from <i>xāx</i> to notice.
cē'kpelept it boils,	from <i>lep</i> to boil.
-xā'gilqjup to cut oneself,	from <i>Lqjup</i> to cut.

Nevertheless this series of stems is sharply set off from all others, since the latter never occur without pronominal elements excepting a few vocatives that will be mentioned later.

The most common verbal stem which is used in connection with these attributes is -*x* to be, to become, to do, to make. -*ō* (-*ī*?) the general verb for motion is sometimes used with stems signifying motion. It seems difficult to classify these words except those that clearly express noises. Among a total of 126 words of this class 44 express activities or processes accompanied by noises; 16 are decidedly imitative; 22 designate states of the mind or body which may be expressed by imitative sounds, such as cold, tired, fear; 7 are terms of color; 45 express miscellaneous concepts, but some of these may also be considered as imitative. It seems likely that in a language in which onomatopoeic terms are numerous, the frequent use of the association between sound and concept will in its turn increase the readiness with which other similar associations are established, so that to the mind of the Chinook Indian words may be sound pictures which to our unaccustomed ear have no such value. I have found that, as my studies of this language progressed, the feeling for the sound value of words like *wāx* to pour, *kjē* nothing, *kjōmm* silence, *Lō* calm, *pā'ēpāē* to divide, increased steadily. For this reason I believe that many words of the miscellaneous class conveyed sound associations to the mind of the Chinook Indian.

It will be noticed that verbs of motion and transitive verbs except such as are accompanied by decided noises are almost absent from the list of these words.

I have found very few cases only in which these words are clearly used as adjectives: *aqlō'cgam ptcix LE'LUWELkLUWELk* green mud was taken 30.21, *lō'lo ikta* something round 127.5. This is possibly due to the rarity of adjectives except numerals and a few others in the texts. It would seem, however, that in most cases derivatives

of these stems are used whenever the substantive or adjective is to be used; for instance: *ma'nix kã'lltac ilã'yuljl klã'qẽwam* when a shaman only has pride 203.18.

In quite a number of cases these words seem to be rather adverbs than attribute complements: *cã'ucan naxayi'llkⁿLẽ* she told him in a low voice 40.21, *lux nulã'tax'it* it fell down broken 49.2, *lke'plkep atciõ'cgam* it took it in its talons 137.15. If I remember rightly the cadence of the spoken sentence, these words must rather be considered as standing alone, the auxiliary verb *-x* being omitted.

LIST OF ATTRIBUTE COMPLEMENTS

a. Actions and Processes Accompanied by Noises

- (*wã* a noise under water 217.15) *tsjEx* (*tcjEx*, *tcjux*, *tsEx*) to break a piece of wood, antlers, etc., with hands 60.7; to split wood 27.2, sinews 138.19, roots 95.14 (not used for splitting planks out of trees); to skin a bird 136.23; to bark a tree 164.16; *tsjE'xtsjEx* 45.19; *natsjEx* a piece of flint flaked off 69.3
- uhũ'* noise of an arrow striking a body 49.3
- (*hemm* noise of wind 41.25)
- hõmm* smell 67.2
- (*hã* noise of an arrow breaking 49.4)
- hẽ'hẽ* to laugh 12.22
- hõ'hõ* to cough
- pemm* noise of flying 72.22
- põ* to blow 66.25, *põ'põ* 129.20
- pã*, *pã*, *pã* 175.3
- (*dell* noise of bursting 49.19, noise of bear spirit 217.14)
- tjEq* to slap 40.25, *tE'qtEq* 26.8
- tõ'tõ* to shake 194.1
- tumm* noise of fire 45.16, noise of bear spirit 217.13
- tEmm* noise of feet 133.17
- t!ãk* to break a piece out of something
- cix* noise of rattles 22.5
- cEll* noise of rattles on a blanket 61.22; *ci'llcill* rattling of breath of one choking 150.7
- cã'ca* to break, to wreck 198.7
- cãu* low voice 162.11, *cã'ucan* 40.21
- cxx* noise of flying birds 137.14
- tcxup*, *tcxep* to extinguish 51.2, to flicker 50.24, *tcxE'ptcxep* 28.8
- tcx* noise of footsteps on sand 75.3
- tcxoa'p* to gnaw, *tcxoa'ptcxoa'p* 175.23
- gumm* a noise under water 217.16
- gõm* noise of something heavy falling down 27.9
- kumm* noise of dancing 167.5
- gE'cgEc* to drive 15.5
- kjut* to tear off 89.25; *kju'tkjut* to clear up (sky) 249.4
- ku'tcxã* to sneeze 64.24
- qull* noise of falling objects 67.1, noise of heels striking the ground 65.13
- qj'a'lqjal* to beat time
- qjẽ* door creaks 66.14

xx to blow 113.20

xā'xa to rub 65.9

xwē to blow nose 113.21; to blow
on water before drinking 213.13

LEk' to break 165.19, *LE'kLEk*
68.16

LE'kLEk to burrow 95.13

LEX to split (planks) 27.1, to burst
204.4, *LjE'XLjEX* to tear
145.20

LE'xLEX noise of scratching 153.7

Lap noise of shooting 272.20

LuX to come out 49.2, 201.1,
Lu'XLuX to pull out (of ground)

138.9

LkE'pLkEp to grasp in talons 137.15

Lk;ōp to squeeze 9.8, *Lk;ō'pLk;ōp*
with eyes run out 29.20

Lq;ōp to cut 114.3

Lxoā'p to dig 23.5, *Lxoā'pLxoāp*
115.15

LjLj to titter 177.15

LjEq to hit, to strike 156.23

Ljāq, *Ljāx* to crackle 38.1, 185.8

Ljlep under water 14.8

b. Descriptive Words

pāl full 39.1, *pā'Lma* 229.24

wāx to pour out 68.1, to take across
river in canoe 23.24, *wā'xwax*
43.2

wāx to light, set afire 28.2, to bloom
165.26

tEmE'n empty, clean

tE'tE to stop doing something

tuwā'x to light, shine 12.1 (see
wāx)

ku'llkull light of weight 199.9

kjam, *kjEm* no, none 37.15

kjōmm no noise

kjā'ya no, none

kjē no 128.5, nothing 14.1, to dis-
appear 128.28

q!El strong, *qjE'lqjEl* hard, 139.8 ;
too difficult 204.12

lep to boil 173.1

lō'lō round 186.23

Ljāk spread out 178.7

Ljmen to break into small pieces,
soft 130.4 ; *Ljme'nLjmen* 17.9

c. Words Expressing States of Mind and Body

iū'Ljl proud 93.16

pEt quiet 177.24

pjalā' quietly, safe 198.4

tEll, *tāl* tired 62.14, *tE'lltEll* tired
all over = rheumatism

tqjēx to like 129.27

t'ayā' well, healthy 165.21

tSEs cold 41.9

tSE'XtSEX unwell, feeling uncom-
fortable

tcxap to hesitate 27.15

tcjē'ktcjēk almost choked 151.1

lāx lonesome 22.3

gu'tgut exhausted

kjEx cloyed 46.24, *kjE'xkjEx* grease
smell 137.7

kjā silent 37.9, 129.2

kjwan hopeful 134.8, *kjwa'nkjwan*
glad 38.20

kjwac afraid 211.15

kjcō stiff in joints

qjam lazy 138.4

qjat to love 41.6

xāx to notice, observe 75.17

LEk_j, *Lāk_j* weak 212.21

Ljō'ya stingy (?) 139.11

Ljā to fear 212.11

Ljḡāq to recover 196.22

d. Color Terms

Lē'El black 25.11

kjās yellow

cpeq gray (dry?) 109.10

tkjōp white 124.25

ptcix green 30.21

Lḡil red 185.20

tsjEmm variegated

e. Miscellaneous Words

iā'c to let alone 187.13

ux to take a chance

wuk_j straight 24.12, *wuk_jEma'*
107.20

pE'nka afoot 217.8, 107.6

pā'nic to give secretly payment to a
shaman 200.7

pā^ε to divide, *pā^εpa^ε* 248.4

pāx unlucky 264.13

pōx foggy 37.4

pux lukewarm

pō'xoiē to make a mistake

mEL_j wet 37.5

manē'x to learn a secret 200.10

tā'mE_{nua} to give up 61.18

tkE'ltkel dull

tkjē to sit looking on

tjā'nuwa to exchange 228.8

nEkō to keep, to retain 277.14

stāq_j war, attack 272.5

stu_x to untie, to unwrap 135.13;

stu'xstu_x 116.10

(*tctāx* around a point)

tsk_jEs to stoop

tcjḡāk strongly 164.9, 110.1

kjau to tie 123.19, *kjau'kjau* 118.6

qoä't reaching 48.6, high water
0.5

quL to hang, to fish with gaff hook
27.16, to put on garment 136.23

qjE'cqjEc dry 14.19 = thirsty 21.1
(*qjōa'p* near 40.9)

qjul low water 198.26

qjUL fast, *qjUL ē'cgam* hold fast
44.15, see *quL*

xuē't half full 166.8

xōp streaming

lāx sideways 267.3, afternoon
63.18, to miss 13.19; *lā'xlax* to
rock 129.2, to deceive 65.19

lu'xlu_x slick

lu'xpamē adultery

LEx to sit still

Lāq to step aside 146.14; to turn
137.12, 63.4; to cut off, to fall
off 154.28, 194.1; to take out
65.11; *Lā'qLāq* zigzag, also plural
for other meanings

Lāx to appear, become visible 23.13,
Lā'xLax to emerge

Lēx to cohabit 228.16, *Lē'x·Lēx* to
prepare corpse for burial 253.3

Lō calm 25.18

luwā' freshet

Ljap to find 261.8

Ljāp fitting 154.8

2. ADVERBS. — The dividing line between attribute complements and a number of adverbs cannot be drawn very definitely. I am particularly doubtful how *t!aya'* 'well' should be classed, and a few others which are placed in parentheses in the preceding list. The word *acuwa'tka* unsuccessful 96.7 may really be *ac-wat-ka* 'and that just ended it.' At least this is suggested by the analogous word *kawa'tka* 'and then it just ends' 117.16.

Adverbs are formed from adjectives by the suffix *-ē*, for instance *mōkct* two, *mō'kctē* twice; *iū' Lqat* long, *iū' Lqtē*. Besides these, there are a considerable number of adverbs which seem to consist of radicals that do not undergo any changes. A few of these are probably compounds. Many of them perform the functions of verbal moods, such as are expressed in many American languages by derivatives of the verb. In Chinook a very few modal ideas only are expressed by derivation. There are three tenses, a potential, an inchoative (*-tck*), a number of frequentatives and usitatives, and a few local terms.¹ Accordingly we find that the corresponding adverbs are almost entirely missing. Most adverbs expressing space relations are derived from nouns, but a considerable number of temporal and modal adverbs occur, the latter expressing certainty, compulsion, intention, etc. These cannot be derived from simpler forms.

<i>ai'aq</i> can ²	<i>pet</i> really
<i>xa'oxal</i> cannot	<i>nākct</i> not
<i>qōi</i> will	<i>na</i> interrogative particle
<i>qē'xtcē</i> without reaching the desired end	<i>lēqs</i> almost
<i>ka'ltas</i> in vain, only	<i>qalā'tcx·i</i> hardly
<i>qā'doxuē</i> must	<i>ā'nqa(tē)</i> already, before
<i>atsuwa'</i> probably	<i>a'lta</i> now
<i>Lx</i> may (implying uncertainty)	<i>ā Lqē</i> later on
<i>kjōma</i> perhaps	<i>kawa'tka</i> soon
<i>lō'nas</i> I don't know (expression of uncertainty)	<i>anā'</i> sometimes
<i>pōc</i> contrary to fact	<i>nau'i</i> at once
	<i>lē, lē'lē</i> a long time
	<i>q;aste'n</i> for the first time

¹ See Swanton, loc. cit., pp. 217 ff.

² Evidently the original significance of this word is "quickly"; for instance *ai'aq nō'ya* (if you tell me to go) I go quickly, *i. e.* I can go.

<i>tcax</i> for a while	<i>tcjṑāk</i> quickly
<i>wixt</i> again	<i>Lawā'</i> slowly
<i>kule'ts</i> once more	(<i>ai'aq</i> quickly)
<i>alā'tēwa</i> again in this manner	<i>txul</i> too much
<i>guā'nsem</i> always	<i>maniqj'ä'</i> too much
<i>wāx</i> next day (<i>wux·i'</i> to-morrow)	<i>tj'ā'qea</i> just like
(<i>kawī'x·</i> early)	<i>ā'la</i> even
<i>qj'ōā'p</i> near	

A number of exhortative particles form a peculiar group of words. They are applied so regularly and seem to be so weak that I do not quite like to class them with interjections. It would seem that the meanings conveyed by some of these have very nice shades.

<i>wuska</i> a somewhat energetic request: now do; let us make an end of it and — 37.12	<i>tayax</i> oh, if he would! 22.4
<i>nixus</i> please, just try to — 130.3	<i>hō'ntcin</i> be quiet
<i>tcux</i> since this is to do (or let us) 24.10	<i>tca!</i> well! introducing a new idea
	(<i>qā'tj'ōcXEM</i> look out!)
	(<i>nau'itka</i> indeed!)
	(<i>tgtj'ō'kti</i> good!)

The last three of these hardly belong here. They are derivatives; *qā'tj'ōcXEM* is probably derived from *tj'ō* well; *nau'itka* perhaps from *nau'i* at once; *tgtj'ō'kti* from *tj'ō* well and *-kta* thing.

3. INTERJECTIONS.—The line between the last group of words and true interjections is very indefinite. As might be expected the number of interjections in this language which has such strong onomatopoeic tendencies is considerable.

<i>ā, ā, ō</i> oh!	<i>nä</i> disapproval 145.12
<i>adē'</i> surprise 29.13	<i>nāqj</i> contemptuous rejection of an offer 124.11
<i>ē</i> pity for hardships endured 187.19	<i>hohū'</i> derisive rejection of a remark 23.25
<i>nā</i> pity 116.15	<i>ahā'</i> ridicule, disbelieve 166.23
<i>anā'</i> pain, regret, sorrow, pity 22.4, 161.13	<i>ehehiū'</i> derision 45.1
<i>ahaha'</i> pain 177.16	<i>lē</i> derision of weakness 60.14, 146.1
<i>anā'x</i> pity 153.8	<i>iä'</i> reproach for foolishness 117.9
<i>hē</i> call 12.2, indeed 38.22, 186.8	<i>nāxaxax</i> anger 186.16
<i>hē</i> a long distance 28.3, 123.13	<i>tcxä</i> that is nothing! 47.4
<i>hō, hohō', ohō'</i> surprise at the success of an action 24.3, 25.22, 67.14	

Lxuä' disgust 46.26

ha'ö'm, *haö'* now I understand! Chihelish)

39.27, 100.23

kuc good! 89.4 (also used by the

'kic oh! (?)

As mentioned before, many of the imitative attribute complements may be used as interjections. This may, indeed, be their original function. Such are *hemm* noise of wind, *kumm* noise of dancing. A few differ so much in form and use from the attribute complements that I include them among the interjections:

ha'lelelelelele noise of flight of an arrow 62.21

wu'lelelelele noise of flight of coaches 77.16

wa'tsetsetsetse cry of bluejay 31.2, 157.25

qa'nawulewulewulewule cry of gull 88.21

wō bark of dog 23.9

wä cry of child 185.24

hä cry of a person weeping 118.8

wāūūū low voice 162.3

kukuku voice of bluejay after he had become a ghost 166.19

In this group belong also the burdens of songs, a few of which occur in the texts.

4. CONJUNCTIONS. — A number of invariable words perform the function of conjunctions. The meanings of a few of these are not quite certain. The most important are the following:

ka and, then, connecting sentences 26.18 *taLi* although I did not expect it, still 74.9

cka and, while, connecting sentences 25.4 *ä'olele* although I did not intend to, still 13.3

kja and, connecting nouns *take* then 135.6

tcx'i a little while passed, then 37.4 *a'lta* now 135.5

(often following *qiä'x* if) *taua'lta* otherwise 134.8

tcu or 276.1 *manix* when 253.14

tatcja although it is so, still 44.4 *qiä'x* if 127.20 (*qē*, *qēc?*)

5. ADJECTIVES. — Color terms, the plural of small, the numerals from two to nine, and the indefinite numerals are used without pronominal prefixes. The color terms were enumerated among the attribute complements,¹ because they are generally used in that

¹ See page 124.

form. *gēn'EM* small 38.17 is used only for plurals. The cardinal and indefinite numerals of this class are —

<i>môkct</i> two	<i>tE'xEM</i> six	<i>ka'nauwē</i> all
<i>lōn</i> three	<i>si'namôkct</i> seven	<i>kapē't</i> enough
<i>la'kit</i> four	<i>kstō'xtkin</i> eight	<i>qāmx</i> part
<i>qu'neM</i> five	<i>koa'itst</i> nine	<i>mank</i> few
	<i>tcä</i> several	

All the cardinal numbers of this group when used as distributives take the suffix *-mtga*; when used as adverbs they take the adverbial suffix *-ē*. The ordinals are formed by the third person pronominal prefix and the possessive form, for instance: *ē'LaLōn* its third one (masculine) 217.21, *alā'lōn* (feminine) 211.20, and from these again ordinal adverbs *ē'LaLōnē* the third time 134.23. When counting human beings all these numerals, cardinals as well as indefinite, take the prefix *a-* and the plural suffix *-kc*. *môkct* two may also take the dual prefix *c-*.

To the groups of indefinite numerals belongs the peculiar form *kanem* each, all, together, which occurs alone only in its distributive form *kanā'mtgemā* 157.23, while generally it appears as a prefix of numerals: *kanemqoa'neM* five together 201.22, *Lkanemqoa'neMiks* 176.8. With *môkct* two it seems to lose its *m*: *skanasmôkst* both 76.14.

II. STEMS USED WITH PRONOMINAL PREFIXES

1. NOMINAL STEMS. — Substantives have always pronominal prefixes which determine their gender, *ī-* masculine, *ō-* feminine, *L-* neuter, *c-* dual, *t-* plural.¹ Apparently all these prefixes, except that of the feminine, agree with the corresponding gender of the third person intransitive, but a closer inspection shows that originally a nominal prefix *w-* must have preceded them. This still occurs in a few nouns, like *wē'wulē* interior of house 46.24; but particularly in geographical names: *Wale'mlem*, ordinarily *ōle'mlem* rotten wood; *Waplō'tcin*, ordinarily *ōplō'tcin* salal-berries on stump; and also in songs: *wēlx* for *ilē'ē* 16.17. This prefix is retained in many cases in the upper Chinook dialects.

The number of nouns derived directly from verbs is remarkably small. While most American languages abound in affixes, by

¹ See Swanton, loc. cit., p. 208.

means of which terms denoting the actor, the instrument, result, place, time of action, and many other derived ideas may be expressed, such derivatives are very rare in the Chinook texts. We do not even find any form expressing the instrument, and the actor and the results of an action are expressed by purely participial forms.¹ Consequently the number of nominal stems is large, for many ideas which in other languages are expressed by words derived from verbal stems, are here expressed by separate stems.

On the whole the derivation of the numerous polysyllabic nouns in Chinook is obscure, since evidently a considerable number of nominal affixes exist which, however, occur so rarely that their significance cannot be determined. Examples are the derivatives from the stem *ēlx* land, country: *ilē'ē* country (the *x* disappears when the vowel following *lx* carries the accent), *lgōlē'lxemk* person, *ē'lxam* town, *tē'lxem* people. From the stem *xē* we have *igoatē'xēxē* bullfrog; from the stem *kon*, *iqto'konkon* woodpecker.

A few affixes only occur fairly frequently, but even in these cases it is sometimes impossible to classify the words satisfactorily.

-kē-. I presume this prefix is the same as, or at least related to, the verbal prefix *-ki*, *-gi*, which signifies that a verb usually transitive is used without object.² This explanation would be satisfactory in *ogilqjup* a cut, *igē'ljmenljmen* something rotten, *tgilē'matk* store, *oguē'paxatē* alder (= wood for dying), *ikjē'wulelql* food, *ē'k'it* payment for a wife, *lkjēwax* torch, flower, *tkipalā'wul* word, *tkimō'cxem* toy, *ikjctē'nax* game.

-qē-. This seems to be a nominal prefix corresponding to the verbal reflexive *-x*³: *ōqōgu'nklatk* club from *-xgunk* to club, *Lqē'tcamētē* comb from *-xelciam* to comb one's self, *Lqēlē'tcuwa* hat from *-xenlē'tcuwa* to hang a round thing on top of one's self, *iqatjē'lxak* panther and *ōqotsiā'yulxak* ants from *-atsē'lxakō* to have a notch around one's self.

Judging from these examples it would seem plausible that most nouns beginning with *-gi-*, *-ki-*, *-kē-*, *-qē-*, *-qjē-* contain these prefixes; for instance: *igē'luxcutk* arrowhead, *igē'mxatk* burial,

¹ See Swanton, loc. cit., 231.

² Ibid., 218.

³ Ibid., 219.

ige'l'otē elkskin, *oqu' n'xak* plank, *ōk'wē'lak* dried salmon, and other similar ones. Here may also belong *oquewi'ge* knife, *oq'wclā'wulx* maturing girl (the one who is moved up, hidden?), *iq'eyō'qxut* old. The extensive use of these prefixes is also illustrated by *iqēk'E's* brass, but *ik'E'sa* gall, both from *k'Es* yellow; *iqē'pjal* doorway (probably from *-pja* into = that into which people always enter).

na- is a local prefix; *naLxoa'p* hole from *Lxoa'p* to dig.¹

-tē a suffix signifying tree, wood: *oguē'p'xatē* alder = wood for dying.

-tk is a nominal suffix the significance of which is quite obscure.² In a few cases it indicates the point of an object, but in many cases this explanation is quite unsatisfactory. It seems possible that this suffix is the same as the verbal stem *-tk* to put down, to deposit, so that its meaning might be something on the ground, or something attached to something else, or a part of something else. This explanation would be satisfactory in words like *i'potitk* forearm, *igē'lu'atcutk* arrowhead, *iwa'nematk* belly cut of a fish; while *i'lemē'tk* bed may be derived from *-ēlx* ground and may mean put down on the ground, *ikaLxE'lematk* dish = put down to eat from.

The following list contains some stems with their nominal and verbal derivatives. It will be noted that in a number of cases the verb is derived from the noun:

<i>-p'xa</i> alder bark	<i>-Lx</i> around neck
<i>ō'-p'xa</i> alder bark	<i>-Lx-ōt</i> it is around the neck
<i>ō-guē'-p'xa-tē</i> alder	<i>i-qj'ē'-Lx-ōt</i> necklace
<i>L-gē'-p'xa-tē</i> alder woods	<i>-tēwa</i> to bail out
<i>-al-ō'-p'xa</i> to dye in alder bark	<i>-x-tēwa</i> to bail out canoe
<i>L-q-L-al-ō'-p'xa</i> dyed cedar bark	<i>o-ēi-tewā'-Lx-tē</i> bailer (= for
<i>-ts/ēLx</i> to notch	bailing out into the water)
<i>i-qa-tsj'ē'Lx-ak</i> what has a notch	<i>-kamōt</i> ³ property
around itself = panther	<i>-x-Emōta</i> to barter
<i>ō-qo-tsj'ā'yoLx-ak</i> those with	<i>t-kamō'ta</i> property
notches around themselves	<i>-kema(tk)</i> ³ baton
<i>-s-x-tsj'ēLx-akō</i> to make a notch	<i>ō'-kumatk</i> baton
around a thing	<i>-xematk</i> to beat time with baton

¹ See Swanton, loc. cit., p. 209

² Ibid., p. 210.

³ Probably a derivative

- <i>kjanxā'tē</i> ¹ drift net	- <i>Lē</i> to catch with herring rake
<i>ō-kjunxā'tē</i> drift net	<i>-x-Lē-n</i> to catch with herring rake
<i>-xEn-kjunxā'tē-mam</i> to go to catch in drift net	<i>i-qa-Lē'-ma-tk</i> herring rake
<i>nauā'itk</i> ¹ net	- <i>mōcx·Em</i> to play, to fool
<i>-xe-nauā'itgē</i> to catch in net	<i>t-ki-mō'cx·Ema</i> toys
- <i>wiuc</i> urine of male	- <i>m^εcX</i> wood
<i>L-ō'-wiuc</i> urine	<i>ē-m^εcX</i> tree
<i>-xa-wiuc</i> to urinate	<i>ō-m^εēcX</i> kettle
<i>o-wiūc-matk</i> chamber	<i>-xEl-meqci</i> to gather wood
- <i>kxamit</i> to pay attention	- <i>Lētcuwa</i> to put hollow thing on top of something
<i>i-ka-kxamit</i> mind	<i>L-qē-Lētcuwā'-ma</i> hat
<i>-a-kxamit</i> to pay attention	- <i>qct</i> louse
- <i>gunk</i> to club	<i>ō-qct</i> louse
<i>ō-qō-gu'nk-La-tk</i> club	<i>-gē-qct-a</i> to louse
<i>-x-gunk</i> club	- <i>k^utck</i> to knit net
- <i>tciam</i> to comb	<i>c-k^utck-mā'tk</i> net shuttle
<i>L-qē-tcam-ē-tē</i> comb	<i>-xEl-gē'-k^utck</i> to knit net
- <i>Lxē</i> to crawl	- <i>tciakt</i> to point
<i>L-qa-Lxē'-la</i> one who crawls	<i>-gEn-tcia-ktē</i> to point at something
much = crab	<i>gi-tcā'aktē-l</i> pointer = first finger
- <i>utca</i> ear	- <i>mq</i> to spit
<i>ō'-utca</i> ear	<i>-ō-mqo-it</i> to spit
<i>-x-wu'tca-tk</i> to hear	<i>-ō-m^ε-a</i> to vomit
- <i>LxEl(Em)</i> to eat	<i>L-mX-tē</i> saliva
<i>i-ka-LxE'l-matk</i> dish	- <i>kta</i> thing, something, what
- <i>εoic</i> to break wind	<i>i-kta</i> thing, something, what
<i>-xE'l-εoic-qc</i> to break wind	<i>-gEm-ō-kti</i> to pay
<i>ō'-εwic-qc</i> wind broken	

On the other hand we find many cases of words, which in most American languages are derived from the same stem, but which are not etymologically connected in Chinook.

blood - <i>qawilqt</i>	to bleed <i>wax</i> (= to pour out)	- <i>lpāt</i> (= to come out)
arrow - <i>kalaitan</i>	to shoot - <i>Lata</i> (= to pull)	to hit - <i>ma^ε</i>
bucket, cup - <i>cgan</i>	to drink - <i>qamct</i>	thirsty - <i>mEqtit</i>

¹ Probably a derivative.

paddle - <i>ski</i>	to paddle - <i>kLēwa</i>	
hook - <i>kik</i>	to fish with hook - <i>Lē</i>	
shaman - <i>qēwam</i>	to conjure - <i>gēlait</i>	shaman's guardian spirit - <i>kawôk</i>
knife -(<i>qe</i>) <i>wiqē</i>	} to cut - <i>xc</i>	
carving knife - <i>Lkjik</i> (= crooked)		
dagger -(<i>qe</i>) <i>wiqē</i>	} to stab - <i>gēLqLa</i>	
lance - <i>squī' LjEm</i>		
spear - <i>moLjanē'</i>		
dead - <i>mEqt</i>	to kill - <i>wa^e, -tēna</i>	murderer - <i>kjaukja</i>
excrement - <i>xalē</i>	to defecate - <i>wētcxa</i>	
disease - <i>tc!a</i>	to send disease - <i>qēwam</i>	shaman who sends disease - <i>Lata</i> (= to shoot)
thief - <i>ēōleu</i>	to steal - <i>xtk</i>	
grease - <i>qatcau</i>	to grease, to oil - <i>tigō</i>	
harpoon - <i>kulkulōL</i>	to harpoon - <i>k^uca</i>	
rain - <i>ēLxatct</i>	to rain - <i>qawilxt</i>	
whetstone - <i>tcā'la</i>	to sharpen - <i>kEla</i>	
tears - <i>laqst</i>	to weep - <i>gE'tsax</i>	
digging stick - <i>Lq</i>	to dig roots - <i>lap</i>	
wedge - <i>tcā'nix</i>	to split wood <i>LEX, tsEx</i>	

In this connection may also be mentioned the curious words designating various occupations, which are formed not from the verb designating the occupation, but from the guardian spirit presiding over it. Thus we have *tqē'qLax* hunter's protector, *ktiā'-xēqLax* one who has a *tqē'qLax* i. e. a hunter; *igē'tal* whaler's protector, *giā'gital* a whaler; *iqamiā'itx* fisherman's protector, *giā'-qamia-itx* fisherman; *ikawôk* shaman's protector, *giLā'xawôk* shaman; *itsjxiā'n* gambler's protector, *giā'tsjxiān* gambler.

The Chinook vocabulary possesses a great many nouns of onomatopoeic origin. All of these contain the imitative group of sounds doubled. Since in onomatopoeic words, when used as verbs, duplication of the stem signifies repetition, the doubling of the stem in nouns may be interpreted as meaning that the particular sound is uttered habitually by the object designated by the onomatopoeic term. Some nouns contain other phonetic elements in addition to the doubled group of imitative sounds.

This class of nouns includes particularly names of birds, of a few other animals, and a miscellaneous group of terms among which are found names of parts of the body and a few terms of relationship. Some of these are not strictly onomatopoeic, but may be included in the class of doubled stems for the sake of convenience.

Birds

<i>t!ē</i>	<i>it!ē't!ē</i> hawk	<i>tsiās</i>	<i>otsiā'stsias</i> robin
<i>qoēl</i>	<i>iqoē'lqoēl</i> owl	<i>qul</i>	<i>ē'qulqul</i> heron
<i>pōē</i>	<i>ipō'ēpōē</i> sp?	<i>lōt</i>	<i>iqsō'tlotlōt</i> sp?
<i>qēs</i>	<i>iqē'sqēs</i> , <i>oē'cēc</i> bluejay	<i>tsjēk</i>	<i>ōmunts!ē'kts!ēk</i> teal duck
<i>qoās</i>	<i>iqoā'sqoas</i> crane	<i>koaē</i>	<i>otc;ē'nakoaēkoaē</i> sp?
<i>qonē</i>	<i>iqonē'qonē</i> gull	<i>tcxEn</i>	<i>tqj;ē'ptcxEntēxEn</i> sprit tail ducks
<i>tsEn</i>	<i>ē'tsEntsEn</i> humming-bird	<i>qēt</i>	<i>cEnqētqē't</i> hawk
<i>goēx</i>	<i>ogoē'xgoēx</i> female mallard duck	<i>kon</i>	<i>iqstō'konkon</i> woodpecker
<i>tcjāk</i>	<i>utcjaktc;ā'k</i> eagle		

Mammals

<i>pEn</i>	<i>ē'pEnpEn</i> badger	<i>cElq</i>	<i>ē'cElqcElq</i> porcupine
	<i>ō'pEnpEn</i> skunk	<i>kōtc</i>	<i>ukō'tckōtc</i> porpoise
<i>nam (?)</i>	<i>enandā'muks</i> otter	<i>tEp</i>	<i>sE'nteptEp</i> shrew

Other Animals

<i>qo</i>	<i>ē'qoqo</i> pike	<i>xē</i>	<i>iqjoate'xēxē</i> bullfrog
<i>Lōx</i>	<i>iLō'xLox</i> oyster	<i>mEn</i>	<i>ōlatsē'mEnmEn</i> newt
<i>lEx</i>	<i>iqalE'xlEx</i> a small fish (see: <i>lEx</i> scales)	<i>lō</i>	<i>sEqjalōlō</i> butterfly

Plants

<i>ma</i>	<i>emā'ma</i> pewter grass	<i>cāq</i>	<i>ucā'qcaq</i> pteris
<i>qEl</i>	<i>ō'ēlqEl</i> polypodium		

Parts of Body

<i>p!ōx</i>	<i>up!ō'xp!ōx</i> elbow	<i>kuc</i>	<i>ckucku'c</i> testicles
<i>tcxōl</i>	<i>utcxō'ltcxōl</i> lungs		

Terms of Relationship

<i>ga</i>	<i>iā'gaga</i> his mother's father	<i>ma</i>	<i>Liā'mama</i> his father
<i>qac</i>	<i>iā'qacqac</i> his father's father	<i>ta</i>	<i>Liā'tata</i> his mother's brother
<i>cga</i>	<i>oyā'cgacga</i> his mother's mother	<i>kjāc</i>	<i>ikjā'ckc</i> boy
<i>kjē</i>	<i>oyā'k!ēkjē</i> his father's mother		

Miscellaneous

<i>pāt</i>	<i>ipā'tpat</i> net	<i>qōm</i> (?)	<i>iqō'mxōm</i> cedar-bark
<i>tcEl</i>	<i>ē'tcEltcEl</i> brass buttons		basket
<i>sEq</i>	<i>ōsE'qsEq</i> buckskin	<i>Lk;En</i>	<i>ō'Lk;EnLk;En</i> open basket
<i>tsEx</i>	<i>LtsE'xtsEx</i> gravel, thorn		
<i>kjoyē</i>	<i>ok;oyē'kjoyē</i> fingering	<i>qula</i>	<i>Lqulā'ula</i> egg
<i>gac</i>	<i>ogō'cgac</i> sealing spear	<i>lEx</i>	<i>ō'lExlEx</i> scales
<i>kup</i>	<i>ikupku'p</i> short dentalia	<i>L!uwalk</i>	<i>ē'L!uwalkL!uwalk</i> mud
<i>qāl</i> (?)	<i>iqā'lخال</i> gambling disks	<i>lEm</i>	<i>ōlEmlEm</i> rotten wood (- <i>lEm</i> rotten bark)
<i>L!al</i>	<i>īL!alL!al</i> gambling disks		
<i>qjāl</i>	<i>iqjālqjāl</i> short baton	<i>qot</i>	<i>iqjē'qotqot</i> fever
<i>qwis</i>	<i>ō'wisqwis</i> breaking of wind		

Among other groups of substantives which are expressed by stem words I mention the following :

Terms of Relationship

L-icX singular, *t-cōlal* plural, relation by blood.

-*akun* all those older than self, particularly elder brother and sister, cousins in elder lines, i. e. father's elder brother's and mother's elder sister's children,¹ and all generations preceding that of grandparents.

kā'pxō elder brother ! elder sister ! addressed.

-*wuX* all those younger than self, particularly younger brother and sister, cousins in younger lines, i. e. father's younger brother's and mother's younger sister's children,¹ and all generations following that of grandchildren.

au young brother ! addressed

āts younger sister ! addressed

-*qāc* (doubled) father's father

-*qcEn* man's son's child

qāc son's child ! addressed

-*ga* (doubled) mother's father

-*kXagan* man's daughter's child

qāc daughter's child ! addressed

-*kjē* (doubled) father's mother

-*kXin* woman's son's child

ka'ē son's child ! addressed

-*cga* (doubled) mother's mother

-*tkin* woman's daughter's child

ka'ē daughter's child ! addressed

¹ This classification of cousins is not quite certain. I am also not quite sure if this term is confined to children of brothers and to those of sisters.

-ma (doubled) } father
-am }

mā'ma father ! (addressed)

-ka child

-naa } mother
-a }

āq son ! addressed

āc daughter ! addressed

-lē term applied by child of a family to another child of the same family and of opposite sex, i. e. brother's sister, sister's brother, boy's father's brother's or mother's sister's daughter, and girl's father's brother's or mother's sister's son.¹

-qamgē term by which children of brother and sister call each other.¹

-mōtx father's brother,

-wulx { man's brother's } child.²
 { woman's sister's }

-kjōtcxa mother's sister,

-ta (doubled) mother's brother,

-Lātx·En man's sister's child.

-Lak father's sister,

-tgēu woman's brother's child.

-qoqcīn relative by marriage.

-pl^εau relative by marriage after death of intermediate.

*-(k·ikal)*³ singular, *-nemc* plural, term mutually employed by husband and wife.

-qsix· mutual relation between husband and wife's parents

-ctē mutual relation between wife and husband's parents

-qix· mutual relation between man and wife's brothers

-tōm mutual relation between woman and husband's sisters

-pōtsxan mutual relation between one of a married couple and the other's brother or sister, the two being of opposite sexes;⁴ i. e. man's brother's wife and wife's sister, woman's sister's husband, and husband's brothers.

Parts of the Body

-L^εa m. body

-katcx m. nose

-qtq m. head

-cqL m. mouth, beak, bill

-qcō m. hair, skin with hair

-mist m. beak

-tspux f. forehead

-utca f. ear

-qōt m. eye

-atcx f. tooth

-xōst d. eyes, face

-tuk m. neck

¹ This classification of cousins is not quite certain.

² Probably cousins of the same family. This relationship includes the children of the woman and the man, whom a widower or widow must marry. See below.

³ Derived from *-kal* man ?

⁴ Marriage involves the duty or privilege of the man to marry one of these, in case of his brother's or wife's death.

-*paa* n. nape
 -*atsx* f. chest
 -*mōkuē* f. throat
 -*kutcx* f. back
 -*mxte* m. heart
 -*to* m. breast
 -*wan* m. belly

-*putc* f. anus
 -*itcx* m. tail
 -*list* n. tail of fish
 -*pote* m. arm
 -*kci* f. finger
 -*ewit* n. leg
 -*pc* n. foot

Names of Animals

In discussing the onomatopoetic nouns we found that many names of animals, particularly of birds, are of this character. A few names of animals are descriptive. These were probably used as alternates in case one name of an animal became tabooed through the death of a person bearing its name, or a name similar to it. Examples are :

iqats;ē'lxak panther = having a notch around itself, i. e. with a thin belly

oqots;iā'yōlxak ants = those having notches around themselves

itcā'yan ā'yaqlq dragon fly = snake's head

ē'galELx mink = going into the water

otcō'itxul spider = dipnet maker

eqē'wam a fish sp. = the sleepy one

okō'lxul mouse = thief

ikju'tkjut (Kathlamet dialect) dog = the one who always breaks (bones)

It is very doubtful if many of the other animal names can be considered as stems. I am inclined to think that most are descriptive names, although we cannot at present give their derivations. This seems plausible, particularly on account of the great dialectic differences between animal names in upper and lower Chinook.

	CHINOOK.	KATHLAMET.
black bear	- <i>i'tsxut</i> m.	- <i>sqē'ntxoa</i> m.
badger	- <i>pEnpEn</i> m.	- <i>p!ē'cxac</i> m.
deer	- <i>mā'cEn</i> m.	- <i>lā'lax</i> m.
mink	- <i>galELx</i> m., - <i>pō'sta</i> m.	- <i>kō'sa-it</i> m.
rabbit	- <i>skē'epxoa</i>	- <i>kanaxmE'nē</i> m.
raccoon	- <i>q;ōala's</i> m.	- <i>Latā't</i> m.
chipmunk	- <i>tsikin</i> f.	- <i>gusgu's</i> f.
crow	- <i>kjunō</i> f.	- <i>tjā'ntsa</i> f.

mouse	- <i>kō'lxul</i> f.	- <i>'cō</i> f.
seal	- <i>'lxaiu</i> f.	- <i>qē'sgoax</i> f.
bird	- <i>lā'lax</i> n.	<i>p'!E'cp!Ec</i> n.
dog	- <i>kē'wicx</i> n.	- <i>kju'tk!ut</i> n.

Other animal names are :

bear, cinnamon	- <i>t!Ek</i> m.	snake	- <i>tcā'yan</i> m.
bear, grizzly	- <i>cā'yim</i> m.	sperm whale	- <i>'mok'txi</i> m.
beaver	- <i>ēna</i> m.	squirrel	- <i>kjāutEn</i> m.
	- <i>qoa-inē'nē</i> m.	sturgeon	- <i>nā'qōn</i> m.
	(- <i>qā'nuk</i> m. <i>Kathlamet</i>)	sturgeon, green	- <i>kaLē'nax</i> m.
coyote	- <i>tjā'lapas</i> m.	swan	- <i>qelō'q</i> m.
rat	- <i>qā'lapas</i> m. <i>Kathlamet</i>	turtle	- <i>'Laxoa</i> m.
buffalo	- <i>tō'iha</i> m.	whale	- <i>'kolē</i> m.
crow (mythical name)	- <i>Laqjō'</i> m.	lynx	- <i>puk</i> m.
duck (sp?)	- <i>wē'guic</i> m.	wolf	- <i>lē'qjam</i> m.
eagle, bald headed	- <i>ninē'x·ō</i> m.	beetle	- <i>'bic</i> f.
elk	- <i>mō'lak</i> m.	a bird sp. ?	- <i>pē'qciuc</i> f.
fish hawk	- <i>ltcap</i> m.	chicken-hawk	- <i>'npitc</i> f.
flea	- <i>'napō</i> m.	mud clam	- <i>'iē</i> f.
grass frog	- <i>qjEnō'nēqēn</i> m.	fresh-water clam	- <i>'sala</i> f.
heron	- <i>qjoa'skjoai</i>	coatch	- <i>'waniō</i> f.
horse	- <i>kē'utan</i> m.	crane	- <i>qjucpalē'</i> f.
kingfisher	- <i>pō'tsElal</i> m.	killer whale	- <i>gaLā'mat</i> f.
lizard (?)	- <i>kinē'pEt</i> m.	dogfish (see shark)	- <i>qjoā'icx</i> f.
mallard duck	- <i>cimē'wat</i> m.	sea bird sp. ?	- <i>Lqekc</i> f.
mountain goat	- <i>ci'xq</i> m.	sea bird sp. ?	- <i>cXulē'x</i> f.
mussel, small	- <i>tguē'(matk)</i> m.	fawn of deer	- <i>q!ē'xcap</i> f.
mussel, large	- <i>niā'(matk)</i> m.	trout (?)	- <i>q!ē'xonē</i> f.
panther	- <i>kjoa'yawa</i> m.	flounder	- <i>'pkicx</i> f.
a bird sp?	- <i>tcu'yam</i> m.	frog	- <i>cuē'eē</i> f.
raven	- <i>koalē'xoa</i> m.	halibut	- <i>Ltcjalō'c</i> f. (said to be borrowed from Quinault)
salmon, fall	- <i>qElEma</i> m.	louse	- <i>'qct</i> f.
salmon, spring	- <i>gu'nat</i> m.	maggot	- <i>'moa</i> f.
salmon, steel head	- <i>goanē'x·</i> m.	mole	- <i>cē'ntan</i> f.
sea-lion	- <i>gē'pix·L</i> m.	mosquito	- <i>'p!onats!Ekts!Ek</i> f.
sea-otter	- <i>lā'kē</i> m.	newt	- <i>qosā'na</i> f.
shag	- <i>'paorwē</i> m.	screech owl	- <i>'cXux</i> f.
shark	- <i>kjā'yicx</i> m.	pheasant (?)	- <i>ni'ctXuic</i> f.
skate	- <i>aiā'iu</i> m.		

pigeon -*qamEn* f.
 porgy -*qalXt!E'mX* f.
 salmon, calico -*'laatcX* f.
 salmon, silver side -*'qazwEn* f.
 salmon, blue back -*tsoyeha* f.
 sea-lion, young -*'xoē* f.
 snail -*ts!Emē'nXan* f.
 snail -*ts!Emō'ikXan* f.
 snail -*L!ē'xtan* f.
 snipe -*ē'Xsa* f.
 fish sp? -*nā'wan* f.

fish sp? -*kjotaqē'* f.
 trout -*p!ā'lō* f.
 fish sp. ? -*'LElō* f.
 woodpecker -*'kXulpa* f.
 woodpecker -*ntciawit* m.
 wasp -*'pa* f.
 shell-fish sp? -*kji-La'ta* n.
 eel -*kā'kolē* dual
 codfish? -*lā'ta-is* pl.
 flounder? -*mē'n^εa*
 grasshopper -*ts!ē'laq*

On account of the intricate derivation of Chinook nouns and our unfamiliarity with the component stems it is impossible to describe the phonetic characteristics of nominal stems. The list of names of parts of the body, given above, contains a number of stems consisting of consonants only, while most of the others are monosyllabic stems. It is doubtful if the purely consonantic stems have originated entirely through phonetic decay. A comparison of the upper and lower Chinook dialects gives no decisive answer to this question.

On the whole I am under the impression that a considerable number of monosyllabic nouns, and perhaps a few of two syllables, may be considered as stems. I give here a brief selection of such words :

-*'pquNX* m. large round spruce root
 basket; f. small round spruce root
 basket
 -*ctc;ē'ct* m. clam basket
 -*'maL* m. bay, sea, river
 -*'ō'k* m. blanket
 -*'lk'au* m. cradle
 -*'qēL* m. creek, brook
 -*'ktcXEm* m. dance of shaman
 -*'Lq* m. digging stick
 -*'am* m. dish
 -*'pqōn* m. down of bird
 -*'qcil* m. fish trap
 -*ci'kc* m. friend
 -*'pXil* m. grease

-*'lX* m. ground, earth
 -*'Lan* m. short thong, string, pin
 for blanket
 -*'cgan* m. cedar
 f. bucket, cup
 n. plank
 -*'tsōL* m. harpoon shaft
 -*'msta* m. hat
 -*'tōL* m. heat
 -*'k'ik* m. hook
 -*kā'pa* m. ice
 -*'paqc* m. boil, itch
 -*'kXōn* m. leaf
 -*'m^εEcX* m. log, tree, wood; f.
 kettle

- <i>'kala</i> m. man	- <i>mā'p</i> f. plank
- <i>'LkuiLx</i> m. mat	- <i>gā'wē</i> f. raspberry
- <i>pā'kxal</i> m. mountain	- <i>'mopa</i> f. rushes
- <i>'sik</i> m. paddle	- <i>gu'nkxun</i> f. salal berry
- <i>'εapta</i> m. roe	- <i>'skL</i> f. sinew
- <i>'pa-it</i> m. rope	- <i>'tcin</i> f. stump, foot of tree
- <i>'nxat</i> m. plank	- <i>'ā'Lax</i> f. sun
- <i>gō'cax</i> m. sky	- <i>'ē'xatk</i> f. trail
- <i>lai'tix</i> m. slave	- <i>mō'tan</i> f. twine of willow bark
- <i>'txa</i> m. point of sealing spear	- <i>'pcam</i> f. piece of twine
- <i>kā'wok</i> m. shaman's guardian spirit	- <i>hā't;au</i> f. virgin
- <i>'c'ō</i> m. horn spoon	- <i>tcā'nix</i> f. wedge
- <i>'maktc</i> m. spruce	- <i>'pLx</i> f. well
- <i>qā'nakc</i> m. stone, f. large boulder	- <i>qLq</i> n. armor
- <i>'kta</i> m. thing	- <i>qoaq</i> n. blanket
- <i>'qat</i> m. wind	- <i>'a'tcau</i> n. grease
- <i>'pxa</i> f. alder bark	- <i>'skuic</i> n. mat bag
- <i>'lE'm</i> f. bark	- <i>'tō</i> n. milk, breast
- <i>'pL;ikē</i> f. bow	- <i>tcuq</i> n. water
- <i>Lē'qtsEn</i> f. box	- <i>kckuī'</i> n. pitch wood
- <i>'pā'utc</i> f. crabapple	- <i>mtk</i> d. spit
- <i>'aLEptckix</i> f. fire	- <i>'kEmôm</i> pl. ashes
- <i>'gaL</i> f. fish weir	- <i>pcō</i> pl. grass
- <i>'lalx</i> f. camass	- <i>quL</i> pl. house
- <i>'tcala</i> f. grindstone	- <i>xt</i> pl. smoke
- <i>'mala</i> f. marrow, kernel	- <i>'skō</i> pl. tattooing
- <i>'pul</i> f. night, darkness	

Nouns Expressing Adjectival and Verbal Ideas

In Chinook a great many adjectives and verbs are expressed by substantives. In these expressions the quality or action becomes the subject or object of the sentence, as the case may be. The Chinook will say: "The man's badness killed the child's poverty," meaning that the bad man killed the poor child. It is true that such expressions are not entirely unfamiliar to us, for we can say, "he went the whole length of the way," or "he mastered the difficulties of the problem," in which we also treat a quality as objective. In Chinook this method is applied to a greater extent than in any other language I know. Many qualities are used only as abstract

nouns, while others may be transformed into adjectives by the prefix *g-* which expresses possession; for instance, *iā'qjatxal* his badness, *giā'qjatxal* the one who has his badness, i. e. the bad one. In the same way verbs appear as nouns. This also is a mode of expression not unfamiliar to us, although the frequent application of such expressions and the ideas they express appear very strange. We can say, like the Chinook, "he makes a hit" and "he has a sickness," instead of "he hits" and "he is sick"; we can even use the verbal idea as the subject of a transitive verb or form analogous passive constructions; for instance, "sorrow filled his heart," "he was seized by a fit of anger," but the absence or rarity of the corresponding verbal forms and the strong personification of the verbal idea in the noun appear to us quite strange.

Most of the nouns of this class are always used with the possessive pronoun. The following examples illustrate their uses:

A'lta (1) *itsano'kstx* (2) *ōlk;Enlk;En* (3) *agiā'lōtk* (4) *ik;Enā'tan* (5)
now (1) she put (4) potentilla roots (5) into (4) the smallness of
(2) a clam basket (3) 43.22

Ohō' (1) *itci'qōqcin* (2) *Li a'xauyam* (3) ! *ohō'*, (1) my wife's relative's
(2) poverty (3)! i. e. oh, my poor relative! 67.21

Taqē' (1) *eē'tcxōt* (2) *iā'lkuilē* (3) just like (1) a bear's (2) similarity
(3) 275.11

Qulē'tc (1) *igō'lgeli* (2) *tcāxt* (3) *Iō'i* (4) once more (1) her lie (2) has
done her (3) *Iōi* (4) i. e. *Iōi* has lied again 163.14

O'lō (1) *aktā'x* (2) *tē'lx·Em* (3) hunger (1) acts on (2) the people (3)
260.16

Kā'naurwē (1) *tElalā'xuke* (2) *ō'tamēō* (3) all (1) birds (2) their chewed
thing (3) i. e. all birds eat of it 40.18

Ta'ke (1) *ā'yate'a* (2) *nixā'lax* (3) then (1) his sickness (2) came to be
on him (3) i. e. then he became sick

Qa'da (1) *itxā'ēalqt* (2) *qtgi ā'xō* (3) ? how (1) shall we make (3) our
wailing (2) ?

Following is a list of these nouns:

Qualities

-*nu'kstx* m. smallness

-'(k;e)*sīL* m. sharpness

-*xalx·tē* m. flatness

-*pik* m. heavy weight

-*ts;axan* m. large belly

-*tc;pux* m. round head (= forehead)

-*p'aqa* m. flat head

-*mEnukt* m. blackened face

-'(ki)*matck* m. spots, painted face

- <i>'wa</i> m. expense	- <i>'tckc</i> m. stench
- <i>'qiatxal</i> m. badness	- <i>'q!Es</i> m. sweet smell
- <i>qjē'latcx·ēna</i> m. meanness	- <i>'ts!ēmEn</i> m. sweetness
- <i>lqjē'latcx·ita</i> m. quiet	- <i>'L!L</i> m. bitterness
- <i>'yulj!l</i> m. pride (see p. 120)	- <i>'Lēlam</i> m. ten
- <i>'kjoac</i> (εōmit) m. fear (see p. 120)	- <i>'kjamōnak</i> m. hundred
- <i>kā'kxul</i> m. homesickness (subject of transitive verb)	- <i>t!ōwil</i> m. experience (from <i>t!ō</i> — good)
- <i>kanā'tē</i> m. life	- <i>'(ke)t!ōi</i> m. } skill
- <i>tsā'tsa</i> m. cold (see p. 123)	- <i>t!ōxōtskin</i> m. }
- <i>'lkuilē</i> m. similarity	- <i>t!ōxakamit</i> m. cleverness (= good mind)
- <i>'tukltx</i> m. good luck	- <i>x!i</i> f. cataract of eye (= smokiness)
- <i>'tc!a</i> m. sickness	- <i>xax</i> n. sadness
- <i>p!onEnkan</i> m. blindness	- <i>'xauyam</i> n. what excites sympathy
- <i>'kunanEm</i> m. diligence	- <i>'patseu</i> n. red head
-(<i>ki</i>) <i>ma'tct(amt)</i> m. shame	- <i>'k^uLil</i> pl. custom
- <i>'Ljkin</i> m. bowlegs	- <i>'kⁱLau</i> pl. taboo
- <i>'Lkjōp</i> m. being squeezed out (= one eyed)	-(<i>ki</i>) <i>pā'lau</i> pl. witchcraft
- <i>qē'wam</i> m. sleepiness (subject of transitive verb, and possessive)	- <i>'katakox</i> pl. cleverness

Verbs

- <i>L!mē'nxut</i> m. lie of a male	} subjects of transitive verb	- <i>'qalqt</i> m. a wail (= to wail)
- <i>gō'LgElē</i> m. lie of a female		- <i>'kux</i> m. smell (= to smell)
- <i>'ma^ε</i> m. act of hitting (= to hit)		- <i>'lō</i> f. hunger (subject of transitive verb)
- <i>'kakamit</i> m. mind (= to think)		- <i>'m^εō</i> f. what is chewed
		- <i>'qōtck</i> f. cold in head

It will, of course, be understood that these words, from the Chinook point of view, do not form a separate class, but that they are simply concrete or abstract nouns, as the case may be. They are in no way different from similar constructions in English, in which the quality of an object is expressed as its *property*. We find, therefore, also, that many ordinary concrete nouns perform the functions of adjectives. *Ayā'pXela* (1) *icimē'wat* (2), literally: the duck (2) its fat (1) means the duck had (much) fat or the duck was fat. The only peculiarity of Chinook in this respect is, that certain ideas, which we consider as qualities or activities, are always

considered as concrete or abstract nouns. A glance at the list shows clearly that quite a number of these words cannot be considered as stems. Some are derivatives of unchangeable words and others are evidently compounds.

It may be mentioned in this connection that substantives are often used to qualify other substantives. In this case the qualifying substantive takes the gender of the one qualified: *ō'kxōla* *ō'ō'wun* a male silver-side salmon 109.3, *ē'ēkil* *i'mō'lak* a female elk 264.3. These qualifiers remain true substantives, as is shown by the feminine prefix *ō-* which is characteristic of substantives.

2. PRONOUNS. — It does not seem necessary to treat personal and possessive pronouns fully in this place, since this subject has been treated by Dr Swanton.¹ I must, however, add a few remarks on the demonstrative pronoun, which has been made the subject of a special study by Mr William Jones. He finds that the demonstrative series consists of two series of three forms. The first series denotes objects visible and present in time, the second objects invisible and belonging to the past. Each series embraces those forms for objects near the speaker, near the person addressed, and near the person spoken of. The first series is characterized by the prefix *x-*, the second by the prefix *q-*. These prefixes are followed by an element indicating gender and corresponding to the personal pronouns of the third person. The locations corresponding to the three persons are indicated for the first person by the suffix *-k*; for the second person partly by the suffix *-u*, partly by the vowel *-ī(-ē-)* following the prefix; for the third person partly by the suffix *-x*, partly by the vowel *-ō-* following the prefix. The series seems to be defective, probably for the reason that the combination of invisible and near first or second person is rare.

The following table illustrates the use of these demonstratives:

	<i>Present, Visible.</i>					
	Masc.	Fem.	Neutr.	Dual.	Plural.	Plural, Human beings.
Near 1st Person	<i>x'ik</i>	<i>x'ak</i>	<i>x'ilik</i>	<i>x'ictik</i>	<i>x'itik</i>	<i>x'itike</i>
Near 2d Person	<i>x'iau</i>	<i>x'au</i>	<i>x'ilā</i>	<i>x'icta</i>	<i>x'ita</i>	<i>x'itac</i>
Near 3d Person	<i>x'ix</i>	<i>x'ax</i>	<i>x'ōla</i>	<i>x'ōcta</i>	<i>x'ōta</i>	<i>x'ōtac</i>

¹ Loc. cit., pp. 210-211.

Past, Invisible.

Near 1st Person	—	—	—	—	—	—
Near 2d Person	<i>qiau</i>	—	<i>qēLa</i>	<i>qēcta</i>	<i>qēta</i>	<i>qētac</i>
Near 3d Person	<i>qix</i>	<i>qax</i>	<i>qōLa</i>	<i>qōcta</i>	<i>qōta</i>	<i>qōtac</i>

Demonstrative adverbs seem to exist in two similar series, for instance, *x'īgō* here, *qīgō* there.

3. VERBS. — The onomatopoeic stems which do not readily form true verbs, and the nouns used for expressing verbal ideas — so far as they are not derivatives — reduce the total number of true verbal stems considerably. These are very brief, consisting sometimes of a single sound, often of a group of consonants, or of a single syllable. Stems of this character are relatively so numerous as to arouse suspicion that all dissyllabic stems may be compounds.

I doubt if it is quite correct to consider the local suffixes enumerated by Swanton¹ as real suffixes. Forms like *ā'yōptck* he goes inland may very well be explained as verbal stems with the directive prefix *-ō*.² That this interpretation is correct is also suggested by forms like *nē'lxla-it* he goes to the beach and stays there which is evidently compounded of *-lx* motion toward the beach, and *-la-it* to be, to remain. Compounds of nouns and verbs are *-mōk*oya* to choke = to be between the throat (*-mōkuē* throat, *-ō*ya* to be between); *cmō'laktcxiict* elk nose (*-mōlak* elk, *-tcxiict* nose). We have also compounds of two nouns; for instance, *aqagē'laktē* woman's things (*-qagē'lak* woman, *-kta* thing).

In many cases it is very difficult to determine the stem of the verb, because it remains often doubtful whether an initial *-x*, *-k*, and *-g* belong to the stem or to a prefix. The following list contains only such stems the phonetic character and significance of which appear reasonably certain. The stems are arranged according to their initial sounds; first vowels, then labials, dentals, palatals, and finally laterals:

-ā'newa first
-ā'nux others, apart
-ā'mka only, alone

-ēxt one (for animals and inanimate objects)
-ē'xat one (person)

¹ Loc. cit., p. 225.

² Ibid., p. 218.

- o||i to go. The forms of this verb are irregular. Some are derived from a stem -i, while others seem to have the stem -ō. It may be, however, that the latter is only the directive prefix -ō-. The stem -i, which is absent in forms like *ā'yō* he goes, *ā'Lō* it goes, reappears in *ayō'yam* he arrives, *ayō'ix* he is in the habit of going *nō'ya* I go
nō'yam I arrive
nē'gEmoya he goes along it
nigēlō'ya I go for a purpose, i. e. I go hunting
ayoē'wulxt he goes up
-xEL||ōi|ma other, different
-wa to pursue
-ā||wa to pursue trans. 217.7
-xā||wa to run pl. intr. 276.9
-xEL||wa|ko to follow around.
-u||wā'|x·it to flee = to be pursued 223.10
-u||wā'|ko to demand 157.19
ā'||wa^ε to kill sing. obj.
-a||wan pregnant 186.6 (= belly)
-ā||wul^ε to swallow 46.12
-ā||wintsx to melt
-u||wē'^ε raw, unripe 93.26
-pEna to jump
-o||pEna trans. with dual object. to jump 192.13
-palau to talk
-o||palarw|u! to address someone, trans. 213.15
-ki||palau substantive to bewitch = word
-o||piā'Lx to gather, to pick 245.5
-o||pēqLa to scratch 26.21
-o||pēL to stretch out 109.12
-pō to close, to shut
-ā||pō to shut a box
-u||pō|t to shut in = to shut eyes 47.18
-x||pōna to carry food to wife's relatives 249.7
-o||pōn|it to put up 29.8
-pōl darkness, night
nō'pōnEm it gets dark 23.5
-ō||pcut to hide 9.10
-o||ptca to lead by hand 130.6
-o||ptcx to mend
-o||p;Ena to pronounce, to utter 253.21
-o||m|ako to distribute, to give presents 98.8
-l||m|ako 77.17
-o||mā'inx rotten 199.26
-o||mē|tck to find, gather up 162.21
-l||mēctx to loan, to lend; trans. with two obj.
-o||mēqL to lick 42.8
-o||mēla to scold 93.24 (= bad? Kathlamet)
-mēxa one more
-o||mEt to grow up 224.4
-ō||mEl to buy 94.20
-ō||mEq^t to die sing. 114.3 to faint 239.6
-ō||mEqtit thirsty 71.1
-mEq to vomit, to spit
-ō||mEq|o·it to spit
-ē||m^ε|a to vomit 13.6
e'||m^εa|lqL qualmish
-xEn||mo'sx·Em to play, to fool, to make fun of 178.18
-ō||t to give 164.6
-t to come
-t|e to come 15.18

- t|ē|mam* to arrive coming 161.14
 -*x||t|akō* to come back 28.21
 -*x||t|akōm* to arrive coming back 16.17
 -*ga||t|lōm* (for -*gatqōm*) to meet 94.11
 -*gEl||ta* to leave 250.8
 -*xEl||ta* to leave 250.10
 -*ēEl||ta|qL* to leave sing. obj. 123.15
 -*ē||ta|qL* to leave plur. obj. 128.7
 -*l||ta|tkc* to leave to somebody 177.5
 -*l||taqt* to meet 164.26
 -*o||tēna* to kill plur. obj. 23.22.
 -*l||tigō* to oil, to grease; trans. with two objects, the direct object
 -*L-* standing for "grease"
 -*xEl||tōm* to accompany 135.20
 -*o||tukc* to suck
 -*tk* to put down
 -*ō||tk* to put away 177.6, to snow 42.1
 -*xEm|ō||tk* to stake 30.16
 -*ō||tg|akō* to step (= to put down around) 240.29
 -*ō|tcin||tk* to put first = to begin
 -*ō||tx* to give away
 -*tx* to stand sing.
 -*ō||tx|uit* to stand 184.20
 -*g|ō|tx* to stand on, to strike 191.20
 -*ō||tx|uit|tcu* to fall down
 -*ō||tx|amit* to place upright 48.5
 -*ō||tx|uitck* to make ready 42.17
 -*xEl||tx|uitck* to get ready
 -*tcam* to hear
 -*x||tcimaq* to understand 165.16
 -*l||tcimaq* to hear 24.18
 -*o||tcēna* to lay down 98.6
 -*o||tceqLk^u* to be crosswise 266.13
 -*gEl||tcim* to strike, to hit 66.4
 -*tct* to move on water
 -*o||tct|tcu* to go down river by canoe 277.3
 -*o||tct|amit* to push into water 74.22
 -*o||tctxōm* to finish 46.23
 -*naxE' ||tctxōm* to finish one's own (breath), to faint
 -*o||tcktc* to wash 39.22
 -*o||tsqat* short
 -*xEl|o||tcx* to observe 25.1
 -*o||tcxEm* to boil 23.4
 -*c* to be somewhere sing.
 -*o||c* to be 219.7
 -*l|ō||c* to be in 151.3
 -*k|ō||c* to be on 39.12
 -*x|ō||c* to be on ground 39.18
 -*o||ci* to roast in ashes 185.4
 -*o||ctx* to carry on back 114.20
 -*cg* to take
 -*o||cg|am* to take 134.1
 -*o||cge|Lx* to take to water
 -*x||cg|am* to take away
 -*gEl|ge||cg|am* to help 28.6
 -*x||cg|al|iL* to play 17.4
 -*o||sko|it* warm 174.14
 -*ckta* to search on beach 88.4
 -*o||ck^u|L* to turn over fire
 -*'||nata* on the other side, across
 -*naxL* to miss something that is needed
 -*o||naxL|atck* to lose 43.17
 -*o||naLx* to wipe

- ni* to tie (?)
 -*kjē*||*ni*|*ako* to tie around 253.2
 -*x*||*ni*|*ako* to tie around 115.24
 -*ngo* to run sing.
 -*xa*||*ngo* to run 23.23
 -*xa*|*tengo* to come running 28.3
 -*o*||*ngō'mit* to cause to run =
 to carry away 27.16
 -*o*||*nguē* to flutter
 -*kēl* to see
 -*ēl*||*kēl* to see sing. obj. 115.1
 -*ē*||*kēl* to see pl. obj. 66.11
 -*ka* to fly
 -*ō*||*kō* to fly
 -*t*||*ka* to come flying
 -*t*||*ka*|*mam* to arrive flying and
 coming
 -*kim* to say
 -*gē'xa* to swim
 -*o*||*guēxa* to swim 14.15
 -*gēl*||*gē'xa*|*xē* to swim across
 217.11
gēxē (-*guēxē* ?) to sweep
 -*o*||*guēxē* 172.5
 -*kō* to go home, to pass
 -*x*||*kō* to go home 25.9, to go past
 -*xa*|*t*||*kō* to come home 212.2
 -*ka* (-*kō* ?)
 -*o*||*kō* to order 129.29
 -*gōn* another
 -*x*||*kxuē* to throw away 17.11
 -*o*||*kuman* to look at 47.2
 -*o*||*kula* to sharpen 15.21
 -*gēta* to pursue, to meet, 197.24,
 23.19
 -*o*||*ktik* to lie down on side 76.8
 -*ktō*|*mit* to take revenge on relative
 of a murderer 203.10
 -*ktuq* to enslave
 -*o*||*kte* to carry 66.4
 -*ktcax* (-*gē'tcax*) to cry 275.2
 -*o*||*ktcan* to hold in hand 271.10
 -*o*||*ktciikt* roasted, done 134.10
 -*o*||*ktciikt*|*amit* to roast 93.26
 -*o*||*kc* to harpoon 92.9
 -*o*||*kct* to see 217.22
 -*o*||*kct*|*am* to go to see 187.10
 -*o*||*kct* (probably the same as -*ktc*
 above) to carry 38.18
 -*x*|*o*||*kcti* to lie down, to sleep
 76.20
 -*xal*|*o*||*kctgo* to throw down 16.8
 -*o*||*k^utk* to make net 95.4
 -*o*||*k^uL* to carry 129.19
 -*t*||*k^uL* to bring 127.13
 -*t*||*k^uL*|*am* to arrive bringing
 67.6
 -*k^uL* to tell
x-t||*guL*|*itck* to tell 37.17
 -*x*||*k^uL*|*ēl* 41.4
 -*kLēwa* to paddle 135.1
 -*o*||*kLpa* to miss 271.13
 -*kja* to haul, to pull
 -*x*||*kja* 117.19
 -*gat*||*kja* to haul here
 -*kjōL* to glue
 -*a*||*q* to meet
 -*ga*||*ēōm* to arrive meeting
 117.24
 -*a*||*qamt* (-*a*||*q*|*amit* ?) to look
 218.11
 -*a*||*qamst* to drink
 -*l*||*qamx* to shout
 -*qana*|*it* to lie
 -*o*||*quna*|*it* to lie down 16.23
 -*k*||*qana*|*it* to lay on top of
 -*o*||*qunā'*|*it*|*x-it* to fall down
 -*qā'yaqt* between
 -*o*||*qa-iL* large
 -*qēna* orphan

- ^ε*ēm* to give food
 -*l*||^ε*ēm* to give food
 -*t*||^ε*ēm* to come to give food
 -*gē*||*qoim* 240.28
 -^ε*ōya* between
 -*n*||^ε*ōya* to put between into
 172.20
 -*a*||^ε*ōya*|*mit* to leave meanwhile
 93.26
 -*a*||^ε*ōya* days = time between
 -*a*||^ε*wēwul* to invite 176.18
 -*t*||^ε*lēwul* to invite here 41.6
 -*a*||^ε*wilx* to hit, to strike 65.12
 -*a*||^ε*ōptit* to sleep 255.16
 -*a*||^ε*ōpk* to steam on stones 97.25
 -*a*||*qōt* to bathe
 -*x*||^ε*ōt* to bathe sing.
 -*x*||^ε*ōyut* to bathe pl.
 -*a*||^ε*ōtc*! to awaken sing.
 -*a*||^ε*ōyut*! to awaken pl. 137.23.
 -*a*||^ε*ōnim* to laugh at 184.3
 -*a*||*qc* to split wood 45.18
 to bite 100.13
 -*a*||*qcti* to be satiated 172.12
 -*qLa* to count
 -*qLā'**x·it* to menstruate = to be
 counted
 -*o*||*xun* to drift, 200.7
 -*o*||*xtk* to steal 163.12
 -*o*||*x·tkin* to research 12.5
 -*xgō* to be transformed
 -*xgō*|*mit* to transform 30.23
 -*a*||*x* transitive: to do; intr.: to be-
 come, to be
 -||*x*|*ōm* to arrive
 -*a*||*x*|*otck* to work = to begin
 to do
 -*xauwē* many
 -*xāyal* common man
 -*xēna* to stand pl., to place upright
 23.6
 -*xēna*|*x·it* to stand pl. 235.19
 -*xomem* to show 41.2
 -*gEn*||*xoten* to help sing. 235.5
 -||*oxoqtc* to invite 60.4
 -*xōL*, *t* dizzy
 -*xōL*, *t* to finish
 -*o*||*xtk* to swim (fish) 63.13
 -*xg*|*aka* to surpass 245.13
 -*a*||*xs* to cut
 -*l* to move
 -*o*||*l*|*a* to move
 -*x*||*l*|*l* to shake, *intr.* 156.14
 -*o*||*l*|*atck* to lift 25.21
 -*lap* to dig
ā -*laxta* next
 -*o*||*lEktc* to roast 124.19
 -*o*||*lxam* to say to; trans. 13.17
 -*LEMāt* next to last
 -*La* to sit, to remain
 -*o*||*La*|*it* to be, to sit 22.10.
 -*gEm*||*La*|*it* to wait for 128.5
 -*xE'*||*La*|*it* dead pl.
 -*k*||*La*|*it* to be in canoe
 -*o*||*Lata* to pull back 38.13
 -*o*||*Lā'ta*|*x·it* to fly about 269
 -*Lk*, *ik* crooked
 -*o*||*Lqat* long
 -*o*||*L!* (-*o*||*Lq*) to win, to surpass
 30.15
 -*LqLa* to strike
 -*ge*||*LqLa* to stab 89.1
 -*xEl*|*ō*||*LqLa* to hammer
 -*xEl*||*LxElEm* to eat
 -*L*, *ala* foolish
 -*L!*, *ElEx* lean

ABORIGINAL REMAINS IN NEVADA AND UTAH

By M. S. DUFFIELD

It should be of interest to students of ethnology to learn of a new field that awaits exploration and study. The writer is a mining engineer by profession and not versed in ethnologic or archeologic research, consequently he made no study of the many evidences of former aboriginal occupancy which he encountered during an extended investigation of the mining possibilities of the country to be traversed by the new San Pedro, Los Angeles and Salt Lake Railroad ; yet it seems to be worth while to note a few observations in the hope that they may interest others with time and facilities for systematic study of the remains encountered.

The field noted lies mainly in Lincoln county, Nevada, and in Washington county, Utah ; it is quite accessible either from the Santa Fé Railroad system or from Salt Lake City via the new San Pedro, Los Angeles and Salt Lake Railroad as far as its present terminus, Calientes, thence by stage to Las Vegas ranch. Or if one goes by the Santa Fé, the main line is left at Blake, San Bernardino county, California, whence he proceeds northward on a spur to Manvel, thence by stage to Las Vegas ranch. The stage distance is about the same by either route. Manvel, Good Springs, and Las Vegas ranch form good stopping places.

In Spring mountains, a monoclinic block-tilting of enormous thicknesses of red sandstones (Devonian) and limestones, there are numerous aboriginal remains to be studied. On the higher slopes of the mountain are many mescal-pits and old dwelling places in the cavernous limestone bluffs. The cavities have been formed by erosion along shear zones and fracture planes. About many of these are found fragments of pottery, stone implements, etc. No one has ever investigated them and little is known about them. There are only two small ranches in the entire Las Vegas valley, and the ranchmen know only what they see in crossing the moun-

tains by an old trail. Nor have many prospectors ever been over the range.

The strata of the main axis of Spring mountains, contrary to the rule of the Great Basin ranges, dip to the west; thus the eastern face of the range presents a precipitous front, in which the red sandstones, graywacke, and limestones can be readily distinguished. In the southern end of the range the red sandstone rises from the level of the mesa toward the north, reaching a perpendicular height of about 2,000 feet opposite Cottonwood Springs, an abandoned ranch at the base of the great red bluff. Above this red sandstone rise gray sandstones for about 1,200 feet, forming precipitous bluffs similar to those of the red sandstone; and lastly above this graywacke tower are imposing strata of limestone which culminate toward the north in Charleston peak (13,000 feet). Although the mountain presents a formidable appearance from the valley, when once the sandstone cliffs are surmounted, which is done by ascending favorable cañons, the upper limestone areas are easily traversed.

But by far the most interesting data for ethnological study are the picture-writings that occur so numerous in the faces of the bluffs. Particularly are they noticeable in the red sandstone. These cliffs have been elevated by orogenic movements from the level of the mesa along some grand line of faulting, and the friction caused by this elevation has resulted in large, smooth faces in the cliffs. The slickened surfaces of these spaces have resisted erosion and presented favorable opportunity for primitive man to perpetuate his records. In many cases the picture-writings are so high up the face of the bluff that it seems as though they had been made only by means of lowering from the heights above, a not inconsiderable undertaking. Higher up in the white sandstone strata there are similar inscriptions, but their meaning must remain unknown until some student of aboriginal petroglyphs deciphers them.

As may be judged by their name, Spring mountains have numerous springs, but these are rare in the neighboring desert region; in fact, these mountains afford the only water within sixty miles to the east and for great distances to the south and west. The greater elevations are covered with a dense growth of piñon, the nuts of which were no doubt a great luxury. The cliffs and precipitous

heights afford shelter from wind and storm. At the base of the mountains the dry arroyos are thickly grown with mesquite and mescrew brush, which affords edible beans. In fact there not only is evidence that the mountains were long peopled, but every reason that they should have been.

Not far from Spring mountains, in the igneous region to the southeast, and also farther south in the western foothills of Providence mountains, are several producing turquoise properties. In every case the discovery of these was due to the finding of old pits and workings, near which many stone implements have been found. Chalchihuitl and calaite, the minerals so greatly prized by the Aztecs and by the Pueblo tribes of New Mexico and Arizona, are found here in paying quantities.

Along the cliffs of Virgin river southward to the Rio Colorado and northward to the Mormon settlements are found a few picture-writings; but the Spring Mountain region affords the largest area for the ethnologist, as well as the least known. In the summer the climate is too hot for successful investigation, except in the higher levels of Charleston mountain, but the early spring months, or the fall, should be favorable seasons for exploration. There are easy stage routes to Las Vegas ranch, and the new San Pedro, Los Angeles and Salt Lake Railroad will pass within eight miles of some of the best picture-writings. The possibilities of the field seemed to me to be such as to warrant systematic investigation.

BOOK REVIEWS

Where did Life begin? A Brief Inquiry as to the Probable Place of Beginning and the Natural Courses of Migration therefrom of the Flora and Fauna of the Earth. A Monograph. By GILBERT HILTON SCRIBNER. New edition. New York : Charles Scribner's Sons, 1903.

This little book, which first appeared in 1883, is now republished without change except a new preface and a short appendix. The polar origin of life is so obvious a corollary from the nebular hypothesis that Kant or Laplace ought to have been the first to suggest it. It is possible that Buffon, who seems really to have been the first to propose it, in 1788, may have reached the idea through Kant's *Theory of the Heavens*, published in 1755. The strange thing is that the great biological thinkers, such as Huxley, Haeckel, and Herbert Spencer, did not at least discuss it. Professor Marsh in his presidential address to the American Association for the Advancement of Science at Saratoga in 1879, gave it a passing mention as confirmed by paleontological discoveries in America. This was about all the attention that the theory received down to the date of the first edition of this book. For the question of the origin of the flora and fauna of Europe, Asia, and America, which has indeed been long discussed and their migration from the arctic regions virtually proved, is quite a different question, as is also that of the southward migration of the human race, which has also been under discussion for about twenty years.

To any one who is convinced that the earth was once too hot to support life and gradually cooled down to its present state, there is no escape from the conclusion that life-supporting conditions first made their appearance at the poles. It would be rather gratuitous to maintain that, notwithstanding this, life did not in reality begin until such conditions had reached some lower latitude. It is much more rational to suppose that life began at the same time and place that the conditions favorable to it first made their appearance. Of the time we know very little, but the place was certainly at one pole or the other, and ultimately at both poles. And here arises a somewhat disquieting element for the confirmed monogenist. If life began at both poles, we certainly have two independent

series, and as there is practically no possibility that a north-pole type should be identical with a south-pole type, there must exist at least two great lines of descent for both the animal and the vegetable world. As to the former, if we assume that the vertebrate type coming down from the Vermes through Amphioxus, was a north-pole type, why may not the molluscan or the crustacean type be a south-pole type? As regards plants the case is more obscure, but it is at least a fair hypothesis that the remarkable "Glossopteris flora" of the southern hemisphere that flourished in late Paleozoic and early Mesozoic time, may have originated at the south pole.

As regards the polar, or at least northern origin of the human race, the readers of the *Anthropologist* do not need to have their attention called to the articles of the Marquis Saporta, based chiefly on the facts brought forward by De Mortillet, which appeared in the *Revue des Deux Mondes* in 1883, nor to the address of Prof. Edward S. Morse before the Section of Anthropology of the American Association for the Advancement of Science in 1884. But Mr Scribner has not ignored the human aspect of the question, though this, like the rest of the book, is purely theoretical, and no facts whatever are adduced. This is not a criticism of the book. In fact it is one of the beauties of it. The book is not large enough to record the facts, and its style and character would have been changed, I had almost said spoiled, by their introduction. Any one who reads the book can see that the author's head was full of facts, and that all he was trying to do was to reason from a store of facts to certain large conclusions. Those who speak disrespectfully of this method are often unable to make any use of their facts, however many they may possess. I do not hesitate to say that, if approached in the proper spirit, pages 51 to 53 of this book may be read with profit by all anthropologists.

LESTER F. WARD.

A Guide to the Antiquities of the Bronze Age. By CHARLES H. READ.
British Museum. Printed by order of the Trustees. London: 1904.
8°, 160 pp., 148 figs.

This is a sequel to the volume published in 1902, under the title *Stone Age Guide*. The present book is devoted to remains in England, but it illustrates also the connections with the Continent. Again, the Bronze Age stands between the Iron Age on the hither side and the Stone Age on the far side. Well does the author say that metallurgy was the most important step in human progress between the invention of fire-making and the development of steam and electricity. The arguments

for a Copper Age preceding the Bronze are carefully examined and found wanting. Quite as futile are attempts to find a very ancient Iron Age as compared with Bronze. In this connection Dr Walter Hough makes the suggestion that in his explorations in Arizona he found that the confined heat in the potters' kilns has been sufficient to fuse and distort the clay and produce vitreous slag. The heating of pit ovens for roasting roots was another device for intensifying heat, and pit furnaces were well known to ancient bronze-workers. However the combination of copper and tin may have been brought about, it was not a sudden discovery. Mr Read follows this earliest metallurgy throughout Britain, France, Germany, Switzerland, Austria-Hungary, Denmark, the Russian Empire, Italy, Spain, Egypt and the eastern Mediterranean, Mesopotamia, Persia, and China, as illustrated in the marvelous collections of the British Museum, in myriad forms of tools and weapons, vessels and utensils, jewelry and insignia, trappings and vehicles. In the introductory chapter, after reviewing the first appearance of metals in human industry, Mr Read takes up the ethnology of ancient peoples inhabiting those parts of the world with which the British Isles and the adjacent countries are most intimately connected. After reviewing the Aryan question and deciding upon Ripley's Alpine race as the one that forced the Aryan language upon the aboriginal inhabitants of Europe, the author examines the graves and their contents for evidence, with the following conclusions: Bronze was introduced into the southern counties of England from the continent; in the mounds only the simplest tools and weapons occur; the Phœnicians probably obtained tin from Cornwall 1500-1200 B. C.; 1800 B. C. is a probable date for the beginning of bronze in Great Britain and Ireland. At the close of the introduction Mr Read presents an interesting example of bringing historical chronology and early culture history together in the establishment of probable dates. The bulk of the volume is devoted to the description and illustration of specimens in the cases.

O. T. MASON.

Comparative Philology. A Comparison between Semitic and American Languages with a Map and Illustrations. By ARNOLD M. LEESBERG, *Dr. Juris*. Leyden, 1903. Late E. J. Brill. 8°, pp. i-viii, 1-83.

In these days of exact philological science, it is difficult to understand how such a work as this was permitted to see the light. The title alone would be sufficient to make competent philologists look askance, but when the contents are carefully examined, the reader is lost in won-

der that a man trained in an exact branch of learning (a doctor juris!) should venture to bring forward such wild comparisons as Dr Leesberg has done. The book deserves notice only as a philological *curiosum*.

In his introduction (pages 1-15) the author gives a rambling and pitifully inadequate account of the Colla (formally known as Aymará), Khetsua, Chiapanec, Mayan, Taino-Carib, and Chukchee languages, devoting but a single page to each. He dismisses the idioms of North America with the remark (page 15): "As to North America, different languages have been considered, but race similarities are to be found, the many migrations through the immense territories not having favoured lasting settlements. It is well known that all these tribes originated in Central America, moving northward." This last statement is quite in keeping with the general tone of the book.

It is in his comparative dictionary, however, that the author really exceeds all canons of true linguistic science. He discusses here about nine hundred words representing some twelve hundred Semitic compounds, comparing American words selected at random, chiefly from six distinct languages, with supposed Hebrew-Aramaic equivalents. The utter futility of any such attempts to connect American with Asiatic languages will be seen from the following examples, which really need little comment: On page 22 he compares Khetsua *ñañuk*, Chiapanec *nasungi*, with Aramaic *ḵanûk(â)*, 'baby.' He compares the Colla *kori*, Khetsua *cori*, with Hebrew *xârûç*, 'gold'; the Taino-Carib *bana*, *bauna*, with Hebrew *binîān*, 'building,' 'house.' These examples I have purposely chosen because there is a faint (of course accidental) similarity between some of the words. When, however, we compare the following, we see how far the author has wandered afield in his vain search for word similarities: Colla *payla*, Khetsua *paylla*, Hebrew *pûr*, 'pot' (?); does he mean the stem from which comes *p'êr*, 'turban'? Colla *sarcha-hata*, Khetsua *chura*, Hebrew *zārāk*, *ḵārâ*, 'reject'?¹ I think these examples are sufficient to demonstrate the method of the work.

The author's chief conclusions (page 83) are as sadly amusing as are the rest of his statements. I. "The unity of the American peoples may be demonstrated by their languages." II. "The Maya, Colla and Khetsua languages . . . show a greater resemblance with the Semitic ones than with any other old linguistic family."

It is hardly necessary to point out that sporadic resemblances in vocabulary between languages belonging to groups far apart from each other are no evidence whatever as to interrelationship, even when these

¹ Hebrew *zārāk* and *ḵārâ* — 'scatter' and 'sprinkle', never 'reject.'

resemblances are really striking and not forced, as is the case with so many of those cited by Dr Leesberg. *À propos* of this, why did he not cite the Khetsua first personal pronoun *ñoka* 'I,' as being cognate with the Hebrew *anokî*? Here was a good opportunity lost! Sporadic similarities of this sort are not uncommon. Thus we have Mandshu *shun* = Eng. *sun*! Mandshu *sengi* = Latin *sanguis* 'blood'; Khetsua *inti* 'sun'; *munay* 'love'; *veypul* 'great' = Sanscrit *indra*, *manyu*, *vipula*.¹ In the same way there are occasional accidental resemblances between Hebrew and Celtic. Thus, Irish *leaca* 'cheek,' Hebrew *l'xi* 'jawbone'! All this proves nothing at all, because sound etymology has little to do with sound itself, but with certain fixed laws which must be carefully studied in every individual language and language-group. Even the most casual observer of the Khetsua postpositional polysynthetic noun system must be convinced at once that this idiom is radically different from the prepositional inflexional Semitic noun. Compare the following Khetsua paradigm:

Nom. *hatun rumi* 'big stone' (*hatun* 'big' *rumi* 'stone').

Gen. *hatun rumij*.

Dat. *hatun rumipaj*.

Acc. *hatun rumita*.

Illat. *hatun rumiman*.

Ablat. *hatun rumimanta*.²

Dr Leesberg's book is only another futile attempt to show a race relationship between the American Indians and the ancient Hebrews, although he disclaims the theory that the American aborigines were the Ten Lost Tribes. It is a pity that the author ever undertook such a task without first seeking competent philological advice. Finally, it may be stated that his English throughout the entire work is nearly as faulty as are his philological conclusions.

J. DYNELEY PRINCE.

Metallic Ornaments of the New York Indians. By WILLIAM M. BEAUCHAMP. (Bulletin of the New York State Museum, No. 73. Archeology, No. 8.) Albany: 1903. 8°, 111 pp., 36 pl., 414 figures.

Dr Beauchamp gives in this, the latest of his publications, numerous figures of ornaments made from brass, iron, copper, bronze, pewter, and silver. The different types illustrated comprise a variety of objects, which afford ample materials for speculation concerning fashions in jewelry among the American Indians after first contact with the whites during the

¹ Compare Humboldt, *Travels*, Eng. transl., I, p. 322, and Sayce, *Science of Language*, I, pp. 148-9.

² Compare Middendorf, *Die Keshua Sprache*, p. 59.

colonial period. The monograph furnishes much food for thought to the student of archeology, and contains a great deal of information for the general reader relating to the manners and customs as well as to the ornamentation of the American Indian to the beginning of the last century. The hundred pages of text are replete with references to colonial publications, most of which are practically inaccessible to the general reader. Both the medals and the coins indicate the period covered to have begun with the first contact of the Caucasian and Indian races, and even in their absence the figures would support the same belief. Wire wristlets and bangles or tinklers of copper or other metal are illustrated by the side of brass bells and arm-bands, or wristlets are shown with head-bands of silver which, judging from their appearance, were made quite recently. Very primitive beads of copper of different types are shown with tubes of the same metal; the first of these may be ancient, the latter are possibly quite modern. Animal figures and gorgets remind one of the precolumbian period, while the sacred medals speak with equal strength of the sacrifices made by the Jesuits to aid in the conversion of the heathen. Ear-rings remind us of ornamentation equally as strongly as do the bronze finger-rings inscribed with sacred emblems, and the crosses and crucifixes of brass and silver are suggestive of the priest and the convent. Brooches of all kinds, emblematic, artistic, and religious, are impressive reminders of the variety in colonial life, and with the Indian this type of ornament was probably one of the most popular, since it enabled him to readily hold together his skin clothing and at the same time to exhibit an ornament which, as shown here, evinced his artistic appreciation.

A study of these early designs is necessary to a proper appreciation of the difference between aboriginal and European workmanship, and though another writer has made reference to these brooches in a highly poetic vein, Dr Beauchamp certainly affords us a good opportunity to study the subject seriously.

It were hardly fair to close our review of this very deserving work without again expressing regret that the illustrations are not of a more satisfactory character.

JOSEPH D. MCGUIRE.

The Arapaho Sun Dance: The Ceremony of the Offerings Lodge. By GEORGE A. DORSEY, Curator, Department of Anthropology. Field Columbian Museum, Publication 75; Anthropological Series, Volume IV. Chicago: 1903. 8°, xii, 228 pages, 137 plates.

In this volume is given for the first time a full account of the elaborate and composite ceremony popularly known as the "Sun Dance."

The account is compiled from the author's notes taken while attending the ceremony among the Arapaho in 1891 and 1892, when he was permitted "to witness the secret as well as the public rites without interference." These observations were supplemented later by explanations made by the "Director of the Dance," to whom and to other "active participants" Dr Dorsey makes cordial acknowledgment in his introductory note.

The difficulties attendant upon the task of setting forth so involved a ceremony as the "Sun Dance" can best be appreciated by those who have made similar efforts, and for the success achieved in the present instance the author is to be congratulated. The work bears testimony to Dr Dorsey's energy and perseverance and to his appreciation of the value of a careful observation of details. The book is a noteworthy contribution to the study of the so-called "Plains Indians."

The author has divided his account into fifteen parts or sections. The first contains the scant bibliography of the ceremony. The following six sections deal with the preliminaries, the articles used, the participants, the time, and the assemblage. Section VIII gives an index of the rites and duties appointed for each of the eight days and nights of the "dance." In section IX the ceremony is given in detail and covers 125 pages of text; it is illustrated with 103 photographic reproductions and two colored drawings. Section X is devoted to the exposition of the designs painted on the dancers; these are reproduced in 22 colored figures and 10 photographic half-tones. The next three sections deal with some of the phases of the ceremony; section XI, with the relation of the Transferrer to the Lodge-maker's wife; section XII, with the Offerings Lodge songs, and section XIII with Torture. In section XIV the social side of the ceremony is presented and three children's games are noted. The account closes with section XV, the "Sun Dance" myths, of which two are recounted — "The Origin" and the "Little Star."

It is impossible within the limits of a review to give an analysis of the ceremony; its composite character forbids, for in it are interwoven parts or fragments of older ceremonials which embody phases of beliefs as to the relation of man to the cosmos, both as to the giving and to the maintaining of life, as well as other ceremonies which pertain to man's social relation to man. Nevertheless, the "Dance" has a well-devised form and orderly structure, and throughout all its complexity the fundamental idea and teaching — namely, the existence of an unseen power within the cosmos which controls the events of man's life and with which man has direct relations — are never lost sight of, but are kept constantly before the participants and the spectators.

"The Sun Dance," to quote Dr Dorsey's words, "is performed in compliance with a vow, . . . in the nature of a pledge, that the speaker will make provision for the erection of the lodge for the proper performance of the ceremony if the Man Above will grant him his wish in regard to some particular matter." The occasions on which such vows are made are sickness, lunacy, dreams, personal danger, etc., and several instances showing the circumstances under which such vows have been made are given. The author points out that the ceremony "may not be considered as a healing ceremony, nor is sickness believed to be cured" by its performance, for "the performance of the ceremony is carried on just the same, even though the individual (in whose behalf the vow was made) should not recover." The fact that the denial of the man's petition or wish, which was the cause of the vow, could not affect his obligation to fulfill his vow, presents a view of man's relation to the unseen powers which should be kept in mind by the student when considering some of the symbolic acts of this ceremony.

Among the objects used in the "Dance" is the one spoken of as the Sacred Wheel; while its use is not confined to this ceremony, it being tribal property, yet it so epitomizes the cosmic symbolism of the "Dance," in which it plays an important part, that it may be well to quote from the description given. It "is about eighteen inches in diameter, . . . made of a rectangular piece of wood; one end . . . tapers like the tail of a serpent, the other . . . represents a serpent's head, . . . near which . . . are several wrappings of blue beads. . . . At four opposite sides of the Wheel are incised designs, two . . . in the form of crosses, the other two resembling the conventionalized thunder bird. . . . Attached by . . . buckskin thongs are four complete sets of the tail feathers of an eagle. . . . The inside of the Wheel is painted red, . . . the periphery is stained black. Concerning the symbolism of the Wheel a considerable amount of information was obtained, which, however, may not be regarded as complete or entirely satisfactory. . . . The disc itself represents the sun, while the actual band of wood represents a tiny water snake, called *henige*, and which is said to be found in rivers, in lakes, near ponds and in buffalo wallows. Later in the ceremony, this lake or pool of sweet water is represented, while near by, on a forked stick, is the owner of the pool, a little bird. . . . The blue beads about the neck of the snake represent the sky or heavens. . . . The four inside markings (*hitanni*) on the Wheel represent the Four-Old-Men who are frequently addressed in the ceremony and who stand watching and guarding the inhabitants of this world. . . . The Four-Old-Men are also spoken of as the Thunder-

bird, . . . and in their keeping is the direction of the winds of the earth. . . . They are Summer, Winter, Day and Night, who, though they travel in single file, yet are considered as occupying the four cardinal points. . . . *Hitanni* is also applied to certain markings, . . . the meaning of which is given variously as the four elements of life, the four courses, the four divides. . . . The four clusters of feathers represent the Four-Old-Men, the feathers collectively . . . the Thunderbird which gives rain. The Wheel . . . may be said to be symbolic of the creation of the world, . . . the sun, earth, the sky, the water and the wind. In the Sun Dance dramatization the Wheel itself is represented in the person of . . . the Transferrer."

Although the ceremony takes place as the result of a vow made by a single person, its performance involves the entire tribe. The Star society leads in many of the preparatory acts and during the "Dance" the warrior societies lend their aid. The active participants are divided into four groups: First, the chief priest, who personates the sun; a woman, the Peace Keeper, who personates the Moon; the keeper of the straight-stem-pipe. Second, the director, who personates the Arapaho tribe; the assistant director; the woman director; these three were assisted by five pupils or neophytes. Third, The Lodge Maker of the Sun Dance, the one who had made the vow; his wife, who personates the Maid; the Transferrer, who had been the Lodge Maker of the preceding Dance and is spoken of as the Grandfather of the Lodge Maker; a woman who personates the earth, and is called the Grandmother of the Lodge Maker's wife. Fourth, all those who fast and dance during the ceremony; twenty-five persons formed this group in the Dance witnessed by the author.

The first four days of the ceremony are devoted to preparatory rites held in secret within a tent set up to the west of the center of the wide camp-circle; during the last four days the public Dance takes place in a circular enclosure which has been ceremonially prepared in the center of the encampment.

Of the details of this elaborate ceremony no mention can be made; its cosmic character is evidenced in many of the rites incident to the acts of preparation and also in those of the Dance itself. Much of the symbolism mentioned in connection with the Wheel reappears in the movements and in the decorations of the dancers.

The benefit derived from the ceremony by those who take part in the rite and endure the long fasts and the stress of the Dance, is through the opening to them of the straight road wherein they and their families may

walk protected from disease and from sorrow, while the gathering of the people in the interest of a common religious belief promoted tribal unity and strength and also afforded opportunity for social interchange and pleasure.

In so full an account as that given by Dr Dorsey, one cannot but regret the omission of the songs, both words and music, from their stated place in different parts of a ceremony — an omission the more to be regretted because of the important place that music fills in all phases of Indian life. Through song the Indian gives expression to emotions that are manifested in no other way, consequently the omission from the record of a ceremony of its attendant songs leaves a blank that seriously injures the integrity of the portrayal.

The term used in the various prayers of the rite and translated “Man Above” would seem to imply that the Arapaho attributed personality to the unseen power. While research has shown that the Indian’s conception of this power is more or less anthropomorphic, it has been equally demonstrated that this conception has never, so far as known, crystallized into the idea of personality. The term “Man Above” raises the interesting question as to the exact nature of the Arapaho belief on this subject.

It is doubtful if the relationship between the myths, given in section xv, and the ceremony is so close as the heading of the section would imply. Among other considerations which might be mentioned in this connection is the fact that they do not adequately explain the underlying motive of the rite, while they play about some of the details of the ceremony in picturesque fashion.

To one who, like the reviewer, witnessed the Sun Dance more than twenty years ago, making all allowance for the difference of tribal version, the picture presented in this volume shows how rapidly aboriginal color is fading from Indian life, even from the sacred ceremonies, and it marks the importance of gleaning in the ethnological field while yet something of the past remains.

ALICE C. FLETCHER.

Annual Archæological Report. 1903. Being part of Appendix to the Report of the Minister of Education. Ontario. Toronto: 1904. 8°, 150 pp., ill.

In this his latest report Mr David Boyle has added another to the series of valuable contributions to Canadian archeology, published under the auspices of the Minister of Education. In addition to twenty pages devoted to a résumé of Museum accessions made during the year, there

are more than a hundred pages of illustrated text covering an interesting discussion of American archeology and technology, which cannot fail to be of value to students on both sides of the Atlantic. The illustrations show an improvement on those in the earlier reports, but they do not yet attain that degree of excellence which is rather expected in scientific publications of the present day.

The origin and workmanship of the effigy stone pipes and of those of clay are fully discussed by Mr Boyle, who argues that they are mostly ancient, and by others who hold the contrary view. A number of illustrations of partly finished pipes add greatly to our knowledge of aboriginal technology. It is believed that Mr Boyle's reports have given the fullest information concerning pipes that we possess from any single locality in America. Copper and bone implements are also interestingly treated as to origin, age, and type. But one of the most valuable features of the report is that which pertains to aboriginal village sites, their location, characteristics, and contents; these are enumerated by definite modern survey maps, on which one may rely for data regarding the subject. This opens up a subject deserving of the most careful attention by archeologists throughout the continent, for the time is already at hand when, owing to increase in population and the tillage of cultivable lands, much that would be valuable to early history is now annually obliterated by the plow. Mr Boyle and the Museum which he represents deserve great credit for inaugurating this most laudable work.

JOSEPH D. MCGUIRE.

PERIODICAL LITERATURE

CONDUCTED BY DR ALEXANDER F. CHAMBERLAIN

[NOTE.—Authors, especially those whose articles appear in journals and other serials not entirely devoted to anthropology, will greatly aid this department of the *American Anthropologist* by sending direct to Dr A. F. Chamberlain, Worcester, Massachusetts, U. S. A., reprints or copies of such studies as they may desire to have noticed in these pages. — EDITOR.]

Ahlenius (K.) Kaffe, te och rörsocker, deras ursprungliga hem och viktigaste produktionsomraden. (Ymer, Stockholm, 1903, XXIII, 243-268, 2 maps.) Treats of the original homes of coffee, tea, and cane-sugar, and their principal centers of production. Arabia was probably the place where coffee was first cultivated, Africa possibly the home of the coffee-tree. The original home of tea may have been in Assam or southwestern China. The sugar-cane was native to some part of northeastern Hindustan or Assam, as Ritter thought.

Anutchin (D. N.) O zadachach' i metodach' antropologii. (Russk. Antrop. Zhur., Moskva, 1902, III, No. 1, 62-88; 13 figs.) General discussion of the problems and methods of anthropology, with reference to the question of the variability of races, the rôle of sociological-anthropological factors, etc. (Ranke, Ripley, Broca, Livi, etc., are drawn upon for maps.)

Baum (Hr) und Kirsten (Hr) Vergleichend-anatomische Untersuchungen über die Ohrmuskulatur verschiedener Säugetiere. (Anat. Anz., Jena, 1903, XXIV, 33-74, 14 figs.) Treats of ear-musculature of horse, cow, sheep, goat, deer, swine, rabbit, etc., with bibliography. The muscles of the human ear correspond not to individual muscles of the animal ear, but to groups of these. The high degree of reduction carries with it the abolition of the ability to move the ear.

Beddoe (J.) De l'évaluation et de la signification de la capacité crânienne. (L'Anthropologie, Paris, 1903, XIV,

267-294, 9 tables.) After discussing the data of Barnard Davis, Flower, Broca and Topinard, Pearson and Lee, Manouvrier, Fawcett, etc., Dr Beddoe gives the results of his special study of 526 heads (estimation of capacity from circumference) of living individuals, chiefly from various parts of the British Isles, of whom at least 60 are men of "superior intellectuality." The conclusion reached is that "an evident correlation exists between head volume and intellectual power."

Colareau (E.) Le problème scientifique d'une langue artificielle. Fondements et progrès de l'Esperanto. (Rev. gén. d. Sciences, Paris, 1903, XIV, 947-958.) Gives general account of the nature and progress of "Esperanto," put forward by Dr Zamenhoff as an international language. The Esperantist literature comprises more than 150 works, including a translation of *Hamlet* by the father of this Latinophile speech.

Coupin (H.) Les funérailles singulières, (Rev. Scientif., Paris, 1903, 4^e s., XX, 621-628.) Treats of funeral rites and customs among the Bagas-Foreth of French Guinea, the Australians, New Caledonians, New Hebrideans, Malaccan negritos, Mincopis, Congo negroes, Zambezan Banyai, Makwas, Kafirs, Khevsurs of the Caucasus, Ostiaks, Hindus, Todas, Ainus of Japan, Cambodians, Tibetans, Samoyeds, Kalmucks, Giliaks, Mongols, Sakalavas and Hovas of Madagascar, etc.

Feindel (E.) Le gigantisme chez l'homme. (Rev. gén. d. Sciences, Paris, 1903, XIV, 209-216, 7 figs.) General discus-

sion of giantism based on Brissaud and Meige. Two chief types are recognized, the infantile and the acromegalic with numerous intermediary varieties. The coexistence of infantilism and giantism is not rare. Giantism is acromegaly of the period of growth proper; acromegaly is giantism of the period of completed growth. Macrosomia may occur at any age and giantism may be quite transitory; the latter is often the case with adolescents.

Flashman (F. F.) External features of the brain of a microcephalic idiot showing absence of corpus callosum. (Rep. Pathol. Lab. Lun. Dept. N. S. W. Gov., Sydney, 1903, 1, 1-18, 10 pl.) Detailed description of brain (wt. 554.25 gr.) of male idiot aged 17 years, died of diphtheria.

Friedrich (Dr) Einige kartographische Aufgaben in der Wirtschaftsgeographie. (Globus, Brnschw., 1903, LXXXIV, 69-72, 85-87.) Author outlines for accompaniment of distribution-map his four economic stages: Animal, instinct, tradition, science, which correspond to the four "culture-stages of Vierkandt. The use of maps is emphasized. He holds that a true picture of the internal condition of man is given by the outward expression in economy of the process of growing freedom from the restraint of nature.

Giuffrida-Ruggeri (V.) Considerazioni antropologiche sull'infantilismo e conclusioni relative all'origine delle varietà umane. (Monit. Zool., Firenze, 1903, XIV, repr. pp. 21.) Discusses the anthropological characters of "infantilism," the so-called "infantilism" of woman, and the origin of human varieties, with references to recent studies of Manouvrier, Godin, Papillault, etc. The author agrees with Manouvrier and Topinard in attributing the "female deficit" (e. g. in brain-weight) to the less active life of woman. Woman is, somatically, less primitive and conservative and more variable than man and her so-called "infantilism" is a chimera. The fixation of somatic characters in the higher races is of recent origin and in spite of invariability of cranial form, they are relatively young, having been really species in process of formation.

— Sulla plasticità delle varietà umane. (Ibid., 158-167.) Holds that a certain

plasticity (shown in the proportion of different skull-types, etc.) exists in the Eurasian and Mediterranean varieties of mankind. Argues against the theory of Boas (followed by Fishberg) that no new type can arise through mingling of two different types.

— La maggiore variabilità della donna dimostrata col metodo Camerano, coefficiente somatico. (Ibid., 294-304.) From the examination by the method of the "somatic coefficient" of 55 male and 55 female bodies of Bolognese, the author finds that the variability of the latter is much greater as to lower limbs, considerably greater as to width of shoulders, and somewhat greater as to upper limbs. By reason of her greater variability woman has an advantageous reserve of plasticity, which is lacking to man. The morphologic superiority of woman, if it exists, removes her even more from the infantile condition than is man. The "superiority" of infantilism rests on an equivocal.

— Crani e mandiboli di Sumatra. (A. d. Soc. Rom. di Antrop., 1903, IX, repr. 64 pp., 5 figs.) Describes in detail, with tables of measurements, etc., 10 male and 4 female crania and mandibles from Sumatra, now in the Museum of Prehistory and Ethnography, Rome. They represent a mixed race with abundant Malayoid elements. The skeleton of the face exhibits also "Indonesian" features. Hindu and Chinese traces are also, perhaps, discernible. In these skulls the bones of the face are very important. Robustness of the masticatory apparatus and volume of mandible are in evidence, signs of morphologic inferiority. The capacity of the female crania ranges 1095-1405 and of the male 1235-1635 cm., the cephalic indices 80-90.2 and 71.5-92.9 respectively.

— La posizione del bregma nel cranio del "Pithecanthropus erectus" e la tendenza neo-monogenista in Germania. (Ibid., 1904, X, repr. 21 pp.) Discusses the arguments of Schwalbe, Macnamara, and Manouvrier as to the position of bregma in the cranium of the *Pithecanthropus erectus*, accepting the opinion of the last. The neo-monogenistic view is represented by Klaatsch, Schoetensack, Alsberg, etc., who favor "an autonomous precocious evolution of the human

- stock, eliminating the anthropoids from the series of our ascendants." On the other side is Manouvrier who upholds the earlier theory of the anthropoid origin of man. In Germany polygenism can hardly make proselytes. Giuffrida-Ruggeri has elsewhere discussed the *Pithecanthropus* and the gibbon as probable ancestors of man.
- Goerth (A.)** Das sittliche Gefühl beim männlichen und beim weiblichen Geschlecht. (*Die Deutsche Schule, Leipzig*, 1903, VII, 166-174.) General discussion. Concludes that women are not "political animals" like men, and consequently should not be placed above the latter in office.
- Hall (G. S.)** The relations between lower and higher races. *Proc. Mass. Hist. Soc.*, Boston, 1903, 2 s., XVII, 4-13.) Treats of extermination, contamination by the touch of civilization, effects of disease, colonization, etc. Appeals for the preservation of the lower races as needful for the complete development of the higher — "an ounce of heredity is worth a hundred-weight of civilization and schooling."
- James (W.)** A case of automatic drawing. (*Pop. Sci. Mo.*, N. Y., 1904, LXIV, 195-201, figs.) Brief account of development of automatic drawing in a man of fifty, accelerated by hypnotic exhibition.
- Joteyko (J.)** A propos des femmes mathématiciens. (*Rev. Scientif.*, Paris, 1904, 5^e s., I, 12-15.) Critique of an article by Loria in a previous number. Mlle Joteyko points out that women can do and have done good work in science, both in their own right, as well as masked behind husbands or brothers.
- Lissauer (A.)** Bericht der vorbereitenden Commission zur Herstellung von Typenkarten. (*Corr. Bl. d. deutschen Ges. f. Anthr.*, München, 1903, XXXIV, 123-125.) Reports organization and briefly discusses objects of committee (appointed at the Dortmund meeting) on the making of maps of types of prehistoric objects, etc.
- Lockyer (N.)** The influence of brain-power on history. (*Pop. Sci. Mo.*, N. Y., 1903, LXIV, 71-86.) From Address of President, British Association, Southport meeting, 1903.
- Loisel (G.)** Les corrélations des caractères sexuels secondaires. (*R. de l'Éc. d'Anthr. de Paris*, 1903, XIII, 325-340.) General discussion. Author holds that secondary sexual characters appear or are exaggerated at the moment of sexual impulse; decrease or disappear when the genital glands are no longer in sexual activity; are modified when the genital glands are diseased; decrease generally or disappear completely after direct castration. The formation of secondary sexual characters may also be influenced by causes (diseases, traumatism) having nothing, apparently, to do with the activity of the sexual glands.
- Lönnborg (S.)** Historisk geografi. (*Ymer*, Stockholm, 1903, XXIII, 298-310.) Discusses the nature and province of historical geography, its problems, etc.
- Loria (G.)** Les femmes mathématiciennes. (*Rev. Scient.*, Paris, 1903, 4^e s., XX, 385-392.) Historical sketch. Author agrees with Möbius that mathematics lie "outside the nature of woman." Still, obstacles are not to be placed in her way.
- Manouvrier (L.)** Les marques sincipitales des crânes néolithiques considérées comme reliant la chirurgie classique ancienne à la chirurgie préhistorique. (*R. de l'Éc. d'Anthr. de Paris*, 1903, XIII, 431-436, 4 figs.) Author argues that the "sincipital marks" on neolithic skulls are due to surgical operations performed for the same purpose by the physicians of ancient classic times — cauterizations or scarifications for affections of the head.
- Conclusions générales sur l'anthropologie des sexes et applications sociales. (*Ibid.*, 405-423.) General discussion. The masculine supremacy of today has deeper roots than man's opinion of the intelligence of woman, but an eternal and fixed social subordination of the one sex is not implied in this. Feminism is an aspect of socialism, from which it is separable neither theoretically nor practically. Evolutionary adaptation of the sexes must produce the lasting social reform.
- Martin (R.)** Ueber einige neuere Instrumente und Hilfsmittel für den anthropologischen Unterricht. (*Corr.-Bl. d. deutschen Ges. f. Anthr.*, München 1903, XXXIV, 127-132, 9 figs.) Brief descriptions of useful new and improved

anthropometer, callipers, instrument-box, goniometer, parallelograph, dioptograph, craniophore, etc. Also a series of glass eyes to serve as color-table. A color-table for the skin is in preparation.

Minakov (P. A.) *Znachenie antropologii v' meditsin.* (Russk. Antrop. Zhur., Moskva, 1902, III, No. 1, 89-101.) General discussion of value of anthropology to medicine — race-pathology, nervous diseases, suicide, significance of anatomical characteristics for identification of criminals, etc., Bertillon system.

Modena (G.) *L'acromegalia.* (R. Sper. di Fren., Reggio, 1903, XXIX, 629-640.) First part of critical résumé of literature. Acromegaly occurs oftener in women, is most common at the age of 20-40 years in both sexes, few cases occur before 20.

Müller (H.) *Essais de taille du silex. Montage et emploi des outils obtenus.* (L'Anthropologie, Paris, 1903, XIV, 417-436, 8 figs.) Gives the results of interesting experiments (subsidied by the French Association for the Advancement of Science) in the production and use of flint hatchets — wood and bone working, trepanning, etc. — after the fashion of primitive man. In 11 hours and 45 minutes the author produced a polished axe; in an hour and 13 minutes (2,200 blows) cut down an oak 0.73 meters in circumference. M. Müller seems unaware of the previous experiments of J. D. McGuire and the late F. H. Cushing along similar lines.

Patrick (G. T. W.) *The psychology of foot-ball.* (Amer. J. of Psych., Worcester, 1903, XIV, 104-117.) Treats, among other things, of the anthropological and "recapitulatory" aspects of such games as foot-ball. The author does not see therein a "return to savagery." The game acts, for both players and spectators, as "a sort of Aristotelian catharsis."

Pearl (R.) *On the mortality due to congenital malformations, with especial reference to the problem of the relative variability of the sexes.* (Medicine, Detroit, 1903, IX, repr. 15 pp.) From consideration of the data as to malformation-mortality in the United States in 1899-1900, given in the reports of the Twelfth Census, the author concludes "in intensity or degree of the malformations woman is more variable than man."

The sex more subject to the abnormalities is less variable with regard to them. These mortality data exemplify the action of natural selection upon man "by the elimination of unfavorable variations."

Poncet (A.) *et Leriche* (R.) *Nains d'aujourd'hui et nains d'autrefois.* (Rev. Scient., Paris, 1903, 4^e s., XX, 587-593.) Treats, with 2 figures, of modern and ancient dwarfs. Gives data concerning two dwarfs (brother and sister) from a village on the river Ain — cases of achondroplasia, true examples of which are becoming more and more rare. Dwarfs of today, of the ethnic sort met with in Germany, Switzerland, France, etc., are, like the ancient pygmies, not examples of pathological, but of atavistic achondroplasia.

Ranke (J.) *Die im Studienjahr 1902-3 an den Universitäten Deutschlands, Oesterreichs und der Schweiz abgehaltenen Vorlesungen und Curse aus dem Gesamtgebiete der Anthropologie: Somatische Anthropologie, Ethnologie und Urgeschichte zusammengestellt nach Ascherson's Universitätskalender.* (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 53-58.) These statistics of lectures and courses in anthropology in the universities of Germany, Austria, and Switzerland, show that Berlin, Zürich, and München offer the most courses. Special courses relating to American anthropology appear at Berlin, Leipzig, Tübingen, Bern.

— *Wissenschaftlicher Jahresbericht des Generalsecretärs.* (Ibid., 116-123.) Contains critical résumés of Heger's *Alte Metalltrommeln aus Südost-Asien* (Leipzig, 1902), Retzius' *Crania Suecica antiqua* (Stockholm, 1900), Retzius and Fürst's *Anthropologia Suecica* (Stockholm, 1900), von Luschan et al. *Ausgrabungen in Sindschirli* (Berlin, 1893-1902), etc.

Reinach (S.) *L'art et la magie à propos des peintures et des gravures de l'âge du renne.* (L'Anthropologie, Paris, 1903, XIV, 257-266.) Compares man of the reindeer age, in the matter of "homeopathic magic," with the Australians (Spencer and Gillen). While not excluding imitation, ornament, the social uses of expression and communication, etc., as factors in the development of art, Reinach holds that the art

of the primitive hunters and fishers of France and Spain owes its great extension to "magic," the idea being that the possessor of an image of an object or a living being could thereby influence it.

Ridgeway (*Prof.*) The origin of the thoroughbred horse. (*Proc. Cambr., Philos. Soc., 1903, XII, 141-143.*) The blood-horse of today does not go back to the small horse of Europe from which came the cart horse, nor is its home in Arabia, where, before the Christian era, horse-breeding was not common. Professor Ridgeway suggests that "the Barbary horse, from which all the fine horses of the world have sprung, was derived either from the zebra of north-east Africa, or, as is more likely, from some very closely allied species now extinct." Zebra markings occur on Arab foals at birth.

Schaefer (*F.*) Einzelentwicklung und Gesamtentwicklung. (*Die Deutsche Schule, Leipzig, 1903, VII, 156-165, 226-237.*) Treats of individual and mass-development from the standpoint of philosophy, biology, pedagogy, etc., also the Ziller "Kulturstufen." The author is an individualist and notes that advance in culture and intellectual development do not mean always the same thing.

Scheppegrell (*W.*) Voice, song and speech. (*Pop. Sci. Mo., N. Y., 1904, LXIV, 261-273, 10 figs.*) General discussion of organs of speech in health and disease.

Seger (*Hr.*) Der Schutz der vorgeschichtlichen Denkmäler. (*Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 125-126.*) Argues for a committee to consider questions relating to the protection of archeological monuments. Committee of society appointed.

Siebs (*T.*) Zur vergleichenden Betrachtung volkstümlichen Brauches: Der Kuss. (*Mitt. d. Schles. Ges. f. Volksk., Breslau, 1903, 1-19.*) Interesting study of the kiss in folk-thought, symbolism, etc. The words for kiss and kissing in various European languages (Teutonic, Slavonic, Latin, Greek, Romance) are investigated and eight groups of kiss-words distinguished, the most common terms being those named after the mouth or the lip. The kiss of love, friendship, relationship, reconciliation, peace, grace, reverence, ceremony, etc., is considered.

Singer (*H.*) Tharschisch und Ophir. (*Globus, Brunschwg., 1903, LXXXIV, 245-248.*) Résumé and criticism of the article of Oppert (see *Amer. Anthr., 1903, N. S., v, 708*). Singer considers that Ophir was not a fixed place, but "an Eldorado, like Peru or Australia," and agrees with the location of Tarshish in southern Spain.

Vaschide (*A.*) Recherches expérimentales sur l'olfaction des vieillards. (*C.-R. Acad. d. Sci., Paris, 1903, CXXXVII, 627-628.*) In sensation and (less) in perception, woman is superior to man in old age with respect to smell. Anosmia increases with age in both sexes.

Walkhoff (*O.*) Die menschliche Sprache in ihrer Bedeutung für die funktionelle Gestalt des Unterkiefers. (*Anat. Anz., Jena, 1903, XXIV, 129-139.*) Discusses views of Fischer and Roux. Concludes that the speech-function and not the masticatory produced the trajectory.

Wilser (*L.*) Die Namen der Menschenrassen. (*Globus, Brunschwg., 1903, LXXXIV, 303-307.*) Discusses the various race names in use from the time of Linnæus down — Blumenbach, Retzius, Cuvier, Topinard, Lapouge — for the peoples of Europe. Wilser expresses himself against language as a race distinction. He recognizes Linnæus' *Homo Europæus* (North European), *Homo afer* (better *Homo niger*), *Homo asiaticus* (better *Homo brachycephalus*), *Homo alpinus*, and besides these *Homo mediterraneus* (including the *Homo præscus* or *H. spelæus*, and also, as dwarf variety *H. nanus*) and *Homo primigenius* (Neanderthal, etc.). According to Wilser Europe was earliest occupied by dolichocephalic races.

Wibling (*C.*) Ett samlingsfynd från stenåldern i Helsingborg. (*Ymer, Stockholm, 1903, XXIII, 314-318, 3 figs.*) Brief account of the finds of the stone age (five flint "saws") in a sand deposit at Helsingborg.

Zaborowski (*M.*) Association française pour l'avancement des Sciences. Congrès d'Angers (Août, 1903). Compte rendu de la section d'Anthropologie. (*R. de l'Éc. d'Anthr. de Paris, 1903, XIII, 341-363.*) Gives brief résumés of papers read at the Anthropological section of the French Association. Archeology still engages the attention of most of those contributing to the program.

EUROPE

Andrae (H.) *Hausinschriften aus Dänemark.* (Globus, Brnschw., 1903, LXXXIV, 53-56.) Contains numerous house inscriptions from all over Denmark, in Latin, Danish, High German, and Low German (a few); also house-marks.

Andree (R.) *Die Becherurnen.* (Ibid., 129-130, 6 figs.) Brief account of the so-called "beaker" urns, based on the article of Abercromby. See *American Anthropologist*, 1903, N. S., v, 560.

Ashley (W. J.) *Early Teutonic society.* (Int. Quart., Burlgtn., Vt., 1903-4, VIII, 236-261.) Discusses works of Stubbs, Waitz, Maine, von Maurer, Fustel de Coulanges, Denman Ross, Seeböhm, Meitzen, Hildebrand, Wittich, Earle, Maitland, Baden-Powell, etc. Professor Ashley concludes that "the mark theory in its attractively idyllic form has gone; the villa theory can hardly take its place." The question is what was the "common freeman," who remains.

d'Azevedo (P. A.) *Exogamia em Cíbões no seculo XV.* (Portugalia, Porto, 1903, I, 860-862.) Cites documentary evidence as to the practise of exogamy in the Portuguese frontier town of Cíbões Portugal, in the latter part of the 15th century.

Botelho (H.) *Instrumentos de bronze no conselho de Villa Real, Trazos-Montes.* (Ibid., 825-827, 7 figs.) Describes bronze hatchets, socketed and unsocketed, a bronze key and other objects.

Brenha (J.) *Dolmens ou antas no conselho de Villa Pouca d'Aguar.* (Ibid., 691-706, 16 pl., and 10 figs.) Describes the various groups of dolmens in Villa Pouca d'Aguar, Traz-os-Montes, and the objects found in connection with them, sculptures, pictographs, flints, stone implements, pottery, "amulets" and symbolic objects, zoomorphic and anthropomorphic stones of a curious sort (plates XXXIV-XXXVI) and of great interest. The animal forms represent the rhinoceros (?), elephant (?), deer, pig (?), cock, etc. Some of the stones, besides pictographs of animals have graphic signs or inscriptions, one of which the author interprets as a prayer to the sun. Note-worthy are three scenes of primitive life: A man with bow and arrow shooting a deer, and another similar picture; a man

seated on a deer holding bow and arrow in left hand while seizing the animal's horns with his right. Such signs of burial as were observed pointed to inhumation with occasional cremation. The pictographic and alphabetic (?) data of Villa Pouca d'Aguar are an important addition to our knowledge of neolithic art in western Europe.

Breuil (L'Abbé) *L'âge du bronze dans le bassin de Paris.* (L'Anthropologie, Paris, 1903, XIV, 501-518, 8 figs.) This fourth section treats of bronze arrows and lances from the Somme basin, their geographical distribution, classification, workmanship, ornamentation, etc. In the Somme region bronze arrowheads are rare and the lances there found are generally inferior in form and strength to those from the rest of the Paris basin.

Burmeister (Dr) *Gross-Dimon.* (Globus, Brnschw., 1903, LXXXIV, 219-223, 6 figs.) An account of the Faroe island Great Dimon and its bird-catchers from Capt. Daniel Bruun's book, *Det Høje Nord* (Kopenhagen, 1902).

Cabanès (M.) *et Nass* (L.) *Les poisons employés au seizième siècle.* (Rev. Scient., Paris, 1903, 4^e s., XX, 559-562.) Chapter from a forthcoming book on *Poisons et sortilèges.* Based on Ambroise Paré, Jérôme Mercurialis, Brantôme, etc.

Capitan (L.), **Breuil** (L'Abbé), *et Peyrony* (M.) *Une nouvelle grotte à parois gravées à l'époque préhistorique. La grotte de Teyat, Dordogne.* (R. de l'Éc. d'Anthr. de Paris, 1903, XIII, 364-367.) Brief account of the cave of Teyat in Dordogne and the animal-figures made on its walls by prehistoric man (horses, bisons, cows, antelopes, etc.) Teyat is the ninth cave in which Quaternary sculptures and paintings have been discovered.

Cartailhac (É.) *Les stations de Bruniquel sur les bords de l'Aveyron.* (L'Anthropologie, Paris, 1903, XIV, 129-150, 295-315, 133 figs.) Treats of the Chateau rock-shelters, the Grotte des Batuls, the Grotte du roc du Courbet, etc., and the art remains of prehistoric man there discovered: nicked flints, stone beads, horn harpoons, bâtons, carved and figured pieces and objects of horn and bone, fish-hooks (?), amulets, etc. Certain objects of bone are thought

to be throwing-sticks or something of the sort, which paleolithic man may have used. Some others may be like the Australian "message-sticks."

Chesneau (M.) Sur la composition de bronzes préhistoriques de la Charente. (C.-R. Ac. d. Sci., Paris, 1903, CXXXVII, 653-656.) Chemical analysis of three bronze implements from an urn-deposit at Venat shows the composition of each to be such as to confirm the opinion that the objects belong to the "cache" of a bronze-caster. An axe from Maison-Blanche is of different provenance.

Cooley (A. S.) The bronze Hermes from Antikythera. (Rec. of Past., Washington, 1903, 11, 207-213, 2 ill.) Description and appreciation of the bronze statue, thought to be Hermes, brought up from the bottom of the sea by Syrnean divers off the coast of Antikythera in 1900-1901. Based on the account in the *Ephemeris Archaeologiké*. The statue was "restored" by M. André.

D'Arbois de Jubainville (M.) Le pantalon gaulois. (Rev. Archéol., Paris, 1903, 337-342.) Ethnographic study of the *braca*, or trousers, of the ancient Gauls, which bear a name of Teutonic origin. Under the empire the Romans adopted to a considerable extent this Gaulish garment.

Etner (Ruth S.) Iceland the heroic nation. (So. Wkmn., Hampton, Va., 1903, XXXII, 473-481, 6 figs.) General account of history, education, literature, industries, houses, etc. According to the author the Icelanders "are scarcely second to the Russians in linguistic ability, many of them speaking five or seven languages."

Fortes (J.) A necropole dolmenica de Salles. (Portugalia, Porto, 1903, I, 665-686, 14 figs.) Describes the neolithic dolmen burial-place of Salles, north of Barroso. Poverty in content and lack of osseous remains are noteworthy. The megaliths are of variable orientation. No metal objects. The pictographs are parallel and undulating lines, etc.

Giuffrida-Ruggeri (V.) Cause probabili della bassa statura in Italia. (Arch. di Psichiatria, etc., Roma, 1903, XXIV, repr., pp. 4.) Among the normal causes of the low stature of the Italians are to be reckoned race and economic conditions, as Lombroso and Livi have noted. To

these the author would add a third, *local endogamy* with consanguineous marriages. The effect of island environment in apparently decreasing the stature of their inhabitants (*e. g.*, Sardinia), and the results of subtraction (by war, etc. and emigration) are also to be considered.

Ilberg (G.) Das Gewicht des Gehirns und seiner Theile von 102 an Dementia paralytica verstorbenen männlichen Sachsen. (Allg. Z. f. Psychiatrie, Berlin, 1903, LX, 330-374, tables.) Details of examination of weight of brain and parts of 102 male Saxons dying of *dementia paralytica* (max. 1,367 gr., min. 915 gr.), aged 20-59 years. The Meynert method was used.

Ivanovski (A. A.) Ob' antropologicheskoy izyachenii inorodcheskogo naeleniya Rossiï. (Russk. Antrop. Zhur., Moskva, 1902, III, No. 1, 112-134.) Brief account of anthropological investigations among the 96 foreign (and aboriginal) peoples of Russia. The bibliography (pages 119-134) relates to 96 tribes and peoples, small and great, from the Abadzek of the Caucasus to the Yakuts. The Ainu, Armenians, Jews, Kal-mucks, Kirghis, Ossetes, and Tatars are well represented in the list of titles.

Jaeger (J.) Speier am Rhein. (Globus, Brnschw., 1903, LXXXIV, 37-41.) Contains notes on man's activity from the time of the Rhine valley *löss* down to the present day.

Kallstenius (G.) Värmländska bargslags-målets ljudlära. (Svenska Landsmålen, Stockholm, 1902, XXI, 1-216, 1 pl., map.) This valuable monograph, devoted to the phonology of the mountain dialect of Värmland, is based on material obtained in 1898-1900. It was accepted as a thesis for Ph.D. at Upsala in 1902. A number of speech-curves, after the "graphic method," are given.

ten Kate (H.) Neuere Publikationen von Dr Robert Lehmann-Nitsche. (Globus, Brnschw., 1903, LXXXIV, 48-49.) Brief notes on Dr Lehmann-Nitsche's articles on the *Gryptotherium*, Patagonian craniology, pathological phenomena in Peruvian ceramic ornamentation, etc.

Keller (L.) Ueber den Geheimbund der Vehme und der Vehmgenossen. (Monatsh. d. Comenius-Ges., Berlin,

- 1903, XII, 27-34.) General discussion utilizing and supplementing Lindner's *Die Vehme* (Münster, 1888), Philippi's *Das Westfälische Vehmgericht* (Stettin, 1888), and Thudichum's *Vehmgericht und Inquisition* (Giessen, 1889). The ecclesiastical use of these secret organizations deserves special attention.
- Lissauer** (A.) *Legende zur Typenkarte für die Radnadeln.* (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 49-52, 10 figs.) Lists the finding places of "wheel"-needles without "ears" (7), one-eared (24), two-eared (2), three-eared (9), four-eared (7). The distribution of these needles with radiform top is of considerable interest for Central European archeology.
- McLaughlin** (A.) The storm center in the Balkans. (Pop. Sci. Mo., N. Y., 1903, LXIV, 173-176.) Brief notes on Turks, Slavic, Roumanian, Greek, and Albanian peoples. Author takes anti-Russian point of view.
- Marlot** (H.) Notes préhistoriques sur le Morvan et les contrées limitrophes. (R. de l'Éc. d'Anthr. de Paris, 1903, XIII, 424-430.) Treats of paleolithic and neolithic remains (flints, hatchets, etc.), bronze objects (few), tumuli, megaliths, enclosures. Joigny and Sens on the Yonne seem to have been the centers of dispersion of paleolithic flints. Spring-cults and rock-cults once flourished extensively in the Morvan, and remnants still survive in folk-custom and folk-lore.
- de Mathuisieulx.** *Reisen in Tripolitaniën.* (Globus Brnschw., 1903, LXXXIV, 42-48, 56-60, 16 figs.) Contains notes on cave-dwellers of Gariana, Berber ruins, remains of Roman edifices and monuments, the Berbers of the Rumya oases, the ruins of Leptis Magna, Tarunah, etc. The number and significance of the ruins in these mountains have been exaggerated.
- Modin** (E.) *Härjedalens ortnamn ock bygdesägnar.* (Svenska Landsmålen, Stockholm, 1902, XIX, 129-264.) Continued from 1901. Historical-etymological study of Härjedal place-names, local tales, etc.
- Nunes** (J. J.) *Jogos infantis.* (Portugalia, Porto, 1903, I, 853-858.) Brief descriptions of 13 out-door and 6 in-door plays and games of Portuguese children of Algarve.
- Pagès-Allary** (J.), **Déchelette** (J.), *et Lauby* (A.) *Le tumulus Arverne de Celles, près Neussargues, Cantal.* (L'Anthropologie, Paris, 1903, XIV, 385-416, 39 figs.) Describes tumulus of Celles and remains there discovered—objects of iron, bronze, pottery, a stone hand-mill, etc. Iron objects are numerous, bronze few, coins and fibulae absent, pottery (non-Roman) abundant. The authors conclude that the tumulus was intended to receive the ashes of some Auvergnian, who lived shortly before Vercingetorix. The finds prove the skill of the Gauls in metallurgy and ceramics.
- Peixoto** (R.) *A pedra dos namorados.* (Portugalia, Porto, 1903, I, 807-80.) Describes a "lovers' stone," from near the Luso-Roman station of Bilhares, now in the City Museum of Oporto. The stone has sculptured upon it a loving couple face to face, in the rude fashion of Lusitanian art.
- *Do emprego ainda recente d'uma mó manual.* (Ibid., 828-831, 6 figs.) Treats of the recent employment of stone hand-mills in various parts of Portugal.
- *O basto.* (Ibid., 822-833, 2 figs.) Describes a statue of a Lusitanian soldier from Refojos de Basto, which has since been transformed into a burlesque figure.
- Piroutet** (M.) *Coup d'œil sommaire sur le préhistorique en Franche-Comté.* (L'Anthropologie, Paris, 1903, XIV, 437-462, 677-710.) Résumés data concerning the prehistoric remains (paleolithic, neolithic, bronze and iron ages) in Franche-Comté. Traces of paleolithic man, caves of reindeer period, neolithic caverns and open air "stations," "camps," burial places, etc.
- Pittard** (E.) *Un cas curieux de dépigmentation non congénitale chez une femme Tsigane.* (Ibid., 317-321.) Describes a case of progressive albinism, involving up to the time of observation in 1902 all the body except most of the face, in a Roumanian Gypsy woman (aged 30) of the Dobrudja. The body is well developed and no degenerative stigmata were observed. No ancestral cases of albinism were discovered, and no unusual condition of parents at birth.
- *Les Skoptzy. La castration chez l'homme et les modifications anthropométriques qu'elle entraîne.* (Ibid., 463-

491.) After brief historical sketch, author gives details of measurements made in 1902 of 30 male Skoptzy from the Dobrudja, where there are two villages of this sect. The effect of castration is to decrease the absolute and relative growth of the bust, the head, the skull, and to increase the absolute and relative growth of stature, and lower half of body, and probably also that of the ear.

Russischen (Die) Sekten. (Globus, Brn-schw., 1903, LXXXIV, 193-194.) Brief accounts, after the Report for 1899 of the Procurator of the Holy Synod, of the Raskolniks, Stundists, Mormons, Tchurikowists, Dukhobors, Molokans, Malewanzy, Chlysty, etc. The Tchurikowists are a new sect discovered in 1899 in the Government of Ssamara. In the same year sectional divisions arose among the Molokans. The Malewanzy have been for some time past growing in strength.

Santos Rocha (A.) Mobilario neolithico disperso no concelho de Nellas, Beria Alta. (Portugalia, Porto, 1903, 1, 810-812, 5 figs.) Brief account of neolithic implements, etc., from Villa Seco, among them several perforated stones.

— Ruinas Romanas de Ançã. (Ibid., 813-816, 3 figs.) Describes briefly the Roman ruins of Ançã and the remains found there, walls, mosaic. Some of the ornamental types are indigenous and pre-Roman.

— e Nunez (J. J.) A necropole luso-romana nos arredores de Lagos. (Ibid., 816-817.) Notes on the Luso-Roman burial-place near Lagos. Evidences of both inhumation and incineration are present — a rare thing in Portugal.

Schliz (A.) Neue schnurkeramische Gräberfunde bei Heilbronn a. N. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 60.) Note on the discovery, in the Grossgartach country, of a neolithic gravemound, in which were "schnurkeramisch" pottery and a skeleton buried at length; and, near Wimpfen, of a crouching skeleton in a stone-slab grave.

Schoetensack (O.) Der durchlochte Zierstab (Fibula) aus Edelhirschgeweih von Klein-Machnow. (Globus, Brn-schw., 1903, LXXXIV, 107-110, 4 figs.) Describes the perforated ornament or fibula

of stag-horn, possibly paleolithic, from Klein-Machnow in the Havel country, which has scratched upon it designs which the author thinks may be intended to represent fishweirs! Dr Schoetensack sees in the discovery of this object further evidence of the northeastern drift of the reindeer-hunters of prehistoric western Europe in the wake of the animal itself.

Schumacher (K.) Die bronzezeitlichen Depotfunde Südwestdeutschlands. (Corr.-Bl. d. deutschen Ges. f. Anth., München, 1903, XXXIV, 90-101, map.) Treats briefly of the finds of the bronze age in southwestern Germany — altogether some 50 certain and some 30 doubtful "collective finds" have been recorded. Some of these doubtless represent votive gifts to the gods, others relics of the work-places of local metal-smiths; most, however, come from trade deposits and are often packed away in a great jar or a box. They show the development of traffic and commerce in this region, the influence of the East, etc.

Schwalbe (G.) Ueber eine umfassende Untersuchung der physisch-anthropologischen Beschaffenheit der jetzigen Bevölkerung des Deutschen Reiches. (Ibid., 73-83.) After referring to the studies and investigations of Virchow, Deniker, Ripley, Ammon, Ranke, Pfizner, Dr Schwalbe outlines plans for obtaining anthropometric data concerning at least 50 percent of the male population of Germany between 20 and 25 years of age. The recruiting service and hospitals must be called upon for much. A unitary scheme of measurement must be adopted — such a one is given on page 83.

Severo (R.) Os dolmens de Traz-os-Montes. (Portugalia, Porto, 1903, 1, 687-690.) General observations based on investigations in 1898 and 1901, serving as introduction to the article of Brenha (q. v.).

— Commentario ao espolio dos dolmens do Concelho de Villa Pouca d'Aguiar. (Ibid., 707-750, 16 figs.) Discusses the "amulets," zoöomorphic and anthropomorphic sculptures, drawings, inscriptions, "alphabetic" characters, etc., discovered at Villa Pouca d'Aguiar. Some of the stones seem to figure *Echinoidea*. Some of the Alvão statuettes resemble the Zuñi fetishes of Cushing.

In some respects the art-specimens of the Alvão dolmens exhibit "a localization of character that is *sui generis*." These remains testify likewise to the "autonomy of primitive European civilizations." Cupped and pitted stones occur. Certain inscriptions (the author compares 34 dolmen-signs, p. 745, with the alphabets of the Mediterranean) would seem to contain real alphabetic signs.

da Silva (A.) A alfaia marítima da ilha de S. Miguel. (Ibid., 834-846, 21 figs.) Treats of fishing apparatus and accessories of the natives of the island of S. Miguel in the Azores—boats, nets, traps, hooks, lines, etc.

da Silva Picão (J.) Ethnographia do Alto Alemtejo. (Ibid., 751-756.) Sketches of life and its activities among the mountaineers in Elvas. Continuation.

Szombathy (J.) Der diluviale Mensch in Europa. (Globus, Brnschw., 1903, LXXXIV, 319-324, 5 figs.) Résumés Hoernes' *Der diluviale Mensch in Europa*, Braunschweig, 1903. (See *Am. Anth.*, v, 695.) For Hoernes, North Africa "is the Orient of diluvial Europe."

Tetzner (F.) Zur Sprichwörterkunde bei Deutschen und Litauern. (Ibid., 61-63.) After discussing nature and content of proverbs, the author cites, for comparison with the corresponding ones in German, some 50 Lithuanian proverbs relating to "the powers that be," one's fellowman, etc. The peasant-people of the Lithuanians feel perhaps more the gulf between the world of authority and the ordinary man and give it sharper expression. Proverbs in general differ rather in expression than in content.

— Lock- und Scheuchrufe bei Litauern und Deutschen. (Ibid., 87-89.) Treats of the "call" and "scare" words for domestic animals in the German and Lithuanian tongues. Of these there are five "strata."

Thomas (P. F.) Cerâmica negra nos districtos de Coimbra e Aveira. (Portugalia, Porto, 1903, 1, 821-823, 2 figs.) Brief description of the "black pottery" of Coimbra, etc., produced today by fumigation, as was perhaps also the case in ancient Etruria.

Viterbo (S.) As candeias na industria e nas tradições populares Portuguesas. (Ibid., 858-860.) Notes on the use of

candles in religious and popular ceremonies, etc.

Vorobiev (V. V.) Ob' antropologicheskagom' izyachenii slavyanskago naeleniya Rossiï. (Russk. Antrop. Zhur., Moskva, 1902, III, No. 1, 102-111.) Résumés his own and others' (particularly Anutchin's) investigations on the physical characters of the Slavonic peoples of Russia. According to Vorobiev the primitive Slavonic type is tall, brunet, brachycephalic. The bibliography (pp. 108-111) has sections on the Great Russians, Little Russians, White Russians.

Wateff (S.) Anthropologische Beobachtungen der Farbe, der Augen, der Haare und der Haut bei den Schulkindern von den Türken, Pomaken, Tataren, Armeniern, Griechen und Juden in Bulgarien. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 58-60.) Gives tables of percentages for 45,418 (boys, 23,824) Turkish, 338 Pomak, 474 Tatar, 737 Armenian, 2,838 Jewish, and 4,589 Greekish children from 6 to 15 years of age in Bulgaria as to color of eyes, hair and skin. The proportion of the blond type (12.96 percent) is highest among the Turks, the brunet (78.69 percent) among the Armenians, the mixed (55.15 percent) among the Pomaks. The highest proportion of blue eyes (21.14 percent) occurs among the Turks, the lowest (4.90 percent) among the Armenians.

Weissenberg (S.) Die Karäer der Krim. (Globus, Brnschw., 1903, LXXXIV, 139-143, 4 figs.) Treats of the physical characteristics, with results of measurements, of 20 men and 10 women—family life and social diversions, religion, festivals, condition of women, funeral rites, etc., of the Karaites (earlier in Jewish history, Ananites) of the Crimea. They seem to be more brachycephalic than the Jews and show oftener the Semitic nose. In children Mongolian facial characters are often very marked. They are looked down upon by the Jews, but are very proud of their Russian citizenship. Dr Weissenberg notes the beginnings of decay among this interesting people.

Welter (Hr) Die Maren oder Mardellen: keltische Wohngruben in Lothringen. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 132-

135.) On basis of his own investigations and those of others résumé here, the author concludes that the *mare* or *mardelle* was made by the Celts and Teutons of the La Tène period, ceasing to be inhabited after the Roman epoch.

Wigström (E.) *Folktrö ock sägner*. (Svenska Landsmälen, Stockholm, 1902, VIII, 213-208.) Continued from 1899, Nos. 651-723, about ghosts; 724-764, dragons, etc.; 765-775, nightmares; 776-785, werwolves; 786-809, tales of persons, etc.; 810-818, historical tales; 819-855, tales of places; 857-905, witchcraft, magic, fortune-telling, etc.

Wilser (L.) *L'origine des Celtes*. (L'Anthropologie, Paris, 1903, XIV, 493-499.) General discussion of the ethnic position of the Celts and the "brachy-brunets," *Homo alpinus*. The "true Celts" are of dolichocephalic race. Wilser agrees with Holtzmann in relating the term *Celt* to Latin *calo*, old Norman *halr*, German *Held*, "man," "hero."

Zaborowski (M.) *Origine européenne des Aryens de l'Asie*. (Rev. Scientif., Paris, 1904, 5^e s., I, 1-7.) Points out how western Asia was Aryanized from ancient Europe. The Aryan problem is to be solved on the basis of an auto-nomic development in Europe, from which center an ethnic stream flowed eastward into western and central Asia. The Persians, e. g., sprang from the neolithic race of southern Russia.

Zemmrigh (J.) *Die Polen im Deutschen Reich*. (Globus Brnschw., 1903, LXXXIV, 213-219, 2 maps.) Discusses the geographical distribution, increase and decrease of the Polish population of the German Empire in 1890-1900. In Prussia the Poles have increased in 108 districts, decreased in 62. In East Prussia the Polish-Masuric population shows an absolute decrease, due to westward migration. In West Prussia the larger part of the province shows Polish increase, and Posen shows a large increase also. The westward drift has affected Brandenburg, Hanover, and Rhenish Westphalia.

AFRICA

Bernard (A.) *Productions naturelles, agriculture et industrie au Maroc*. (Rev. gén. d. Sciences, Paris, 1903, XIV, 73-87, 9 figs.) The section on industries

treats of fire-arms and other weapons, basketry, carpets, leather-work, pottery, etc. The pottery industry is concentrated at Fez and Saffi.

— *Le commerce au Maroc*. (Ibid., 132-147, 4 figs.) Interesting account of the commercial activities of a country possessing practically neither roads nor bridges; native and foreign trade. Insecurity, not absence of ways of communication, is the great bar to the development of trade and commerce.

Bière (La) *des Cafres*. (Rev. Scientif., Paris, 1903, 4^e s., XX, 602-603.) Describes, after the account of M. Loir in *Revue d'Hygiène* for October, 1903, the making of beer by the women of the Matabeles of Bulawayo.

Caustier (E.) *L'âme soudanaise*. (Rev. gén. d. Sciences, Paris, 1903, XIV, 61-62.) Résumés an address by Dr Barot before the Union Coloniale Française on the black races of the Soudan. There does exist a "Soudanese mind," capable of growth and development.

Dar-es-Salaam. *Ein ostafrikanisches Städtebild*. (Globus, Brnschw., 1903, LXXXIV, 89-93, 5 figs.) Brief account of the capital of the German protectorate in East-Africa and the condition of life there for Europeans, etc.

Destenave (*Lieut. Col.*) *Le lac Tchad*. II. *Les habitants, la faune, la flore*. (Rev. gén. d. Sciences, Paris, 1903, XIV, 717-727, 19 figs.) Contains notes on the natives of the islands in Lake Tchad, the Kuris, Budumas, etc. Agriculture, political and social organization, trade and commerce, boats, houses, clothing, arms, domestic animals, hunting, etc., are considered. These islanders possess a special breed of cattle. Their reed pirogues and wooden floats are interesting.

Doutté (E.) *Les Marocains et la société Marocaine*. I, *Les origines et l'histoire*. II, *Les Marocains actuels; Mœurs, coutumes*. III, *La religion*. IV, *La société*. (Ibid., 190-208, 258-274, 314-327, 373-387, 24 figs., some of race-types.) Historical and ethnographic sketch of the peoples of Morocco, their social and religious institutions, customs, habits, folk-medicine, etc. The Moroccans can be divided into Arabophones and Berberophones; nomadic and sedentary; mountaineers and plain-dwellers; much

and little Islamized. The author objects to the distinction between Arabs and Berbers, the *ensemble* being really Berber, the so-called Arabs being only the most Islamized.

Fies (F.) Der Yamsbau in Deutsch-Togo, (Globus, Brnschw, 1903, LXXXIV, 266-272, 4 figs.) Interesting account of the planting, cultivation, digging, storing and cooking of yams among the Ewe negroes. The yam is the "national food" of these people, and 42 varieties are distinguished by name. The "yam-house" is a characteristic structure.

Gentz (Leut.) Einige Beiträge zur Kenntnis der südwestafrikanischen Völkerschaften, II. (Ibid., 156-159, 4 figs.) Treats of music and dancing, wildebeest-dance, "doctors' dance," procedure of shamans, bodily ornament-face-painting, etc., among the Bushmen. In contrast with those of the Herero, the Bushmen songs are generally "Lieder ohne Worte"; they are also less obscene in their dances; with them women are likewise more life-companions. Face-painting has a religious significance and is performed by the shamans.

— Die Verbindungsstrassen durch die nördliche Kalahari. (Ibid., 265-366, map.) Brief account of the roads over the northern Kalahari desert.

Inderansiedelungen (Die) bei Tanga. (Ibid., 74-76, 2 figs.) Brief account of the immigrants (Khojas, who are Shiite Mohammedans, and heathen Banians from Katch) in Tanga, German East Africa.

Klose (H.) Wohnstätten und Hüttenbau im Togogebiet. (Ibid., 165-173, 185-192, 12 figs.) Interesting descriptions of dwellings and house-building among the Ewe, Guan, in Apai and Kraty among the Haussa, in Salaga, in the *hinterland* in Adele, among the bush-tribes in Temu, etc. In central and northern Togo the houses are round, while among the Ewe the square variety, due probably to European influence, prevails. Ashanti influence is evident in Boém, Nkunya, etc. In Atakpama and Akprossa two-story square houses of clay occur.

von Liebert (E.) Die Besiedelung Deutsch-Ost-Afrikas. (Ibid., 261-263.)

Ways of communication, markets, etc., are necessary for development and utilization of such sections as are habitable by Europeans.

Seidel (H.) Kamerun im Jahre 1902. (Ibid., 93-95.) Contains a few notes on whites, negroes, etc.

Singer (H.) Aus den Ruinen von Simbabwe. (Ibid., 176-178.) Résumés Mennell's *The Zimbabwe Ruins* (Bulawayo, 1893). Mennell rejects the idea that Rhodesia was Ophir or that the Phœnicians are responsible for the structures represented by the ruins of Zimbabwe, etc. Rhodesia may have been one of the lands whence the Sabæans obtained gold, and that people may have erected some of the buildings of Zimbabwe.

— Die Lage in Nordkamerun. (Ibid., 263-265.) Brief discussion of political and economic condition in North Cameroons. The author thinks the possibilities of a Mohammedan "holy war" are exaggerated. The policy of the Germans is *minima non curat prætor*.

— Marokko. (Ibid., 286-287.) Discusses recent events and the possible partition of Morocco, in which Germany must have some say.

Smith (G. E.) The so-called "Affenspalte" in the human (Egyptian) brain. (Anat. Anz., Jena, 1903, XXIV, 74-83, 6 figs.) Author holds that "the so-called 'Affenspalte' is not the exclusive property of the apes, because it certainly is present in the great majority of, if not in all, human brains." It was found not to be absent once in several hundred Egyptian brains.

— The "limbus postorbitalis" in the Egyptian brain. (Ibid., 139-141, 1 fig.) Out of 36 adult brains 22 show this peculiarity, with tendency to develop on left side.

Weisberger (F.) Voyage de reconnaissance au Maroc. II, Climat, flore, faune, population. (Rev. gén. d. Sciences, 1903, XIV, 509-519, 6 figs.) Contains brief notes on the Bedouins, etc.

— Pathologie et thérapeutique marocaines. (Ibid., 567-573.) Brief but valuable notes on diseases and folk-medicine. The *materia medica* is listed on p. 573. Diseases of the nervous system are

rare ; malaria less common than generally believed. Medicine is no longer taught at the University of Fez.

ASIA

Ackerman (Jessie) The aboriginal race of Japan. (So. Wkmn., Hampton, Va., 1903, XXXII, 593-599, 6 figs.) General description—physical appearance, dress and ornament, tattooing, house-building, food, agriculture, religion, social organization. To the article is added an account of Mr Oyabe, the Japanese missionary to the Ainu. No original material.

Bälz (E.) Zur Psychologie der Japaner. (Globus, Brnschw., 1903, LXXXIV, 313-319.) A spirited protest against the recent characterization of the Japanese by ten Kate (See *Amer. Anthropol.*, 1903, N. S., V, 159), which Dr Bälz considers mistaken, one-sided, and pessimistic. Bälz emphasises the possession by the Japanese of the warlike spirit, neophily, *joie de vivre*, sense of humor, etc. Even 20 years ago Japan was a curiosity ; today it is a world-power. The transition state of the Japanese people is also to be remembered in this discussion.

Bois (D.) Les produits végétaux à l'exposition d'Hanoi. (Rev. gén. d. Sciences, Paris, 1903, XIV, 1003-1008.) Notes on the cultivation and use of plants and their products of Farther India.

Brown (A. J.) Industrial training in Asia. (So. Wkmn., Hampton, Va., 1903, XXXII, 375-380, 4 figs.) Brief notes on industrial schools under missionary auspices in Syria and India. According to the author it has "come to stay."

d'Enjoy (P.) L'accouchement en pays Annamite. (Rev. Scientif., Paris, 1904, 5^e S., I, 51-53.) Treats of the *ba-mu* ("old woman") or accoucheuse, a sort of priestess, whose hut is haunted and who is otherwise of a mysterious nature. The shooting stars and comets are *ba-mus* on their travels. Simulation of accouchement by the husband is in vogue.

Flint (J. M.) Chinese medicine. (Smiths. Misc. Coll., Washington, 1903 [1904], Quart. Iss., I, 180-182.) Brief account of theories of disease, examination of patient, knowledge of anatomy, materia medica. The author thinks "it can hardly be doubted that a system of

medical practice was established in China long before any now known to have existed among western nations." Knowledge of anatomy was crude, examinations of bodies of the dead not being allowed. The *yin* and *yang* theory controlled medical practice. The *Pen-ts'ao*, or synopsis of materia medica (latest edition 1826), treats of 1892 drugs, in 10,000 formulæ.

Ghosu-el-Howie (*Mrs*) Rock sculptures at Nahr-el-Kelb. (Rec. of Past, Washington, 1903, II, 195-207, 5 ills.) These rock sculptures include 3 Egyptian and 9 Assyrian. Some are of no little historical importance, and one was said in 1882 to contain an inscription of Nebuchadnezzar.

— The Buddhist relic mound at Sopara. (Ibid., 297-307, 3 figs.) Reproduces from the *Bombay Gazetteer* the account of the opening of this mound in 1882 and the discovery of the begging bowl of Gautama and other relics.

Henning (C. L.) Die Ergebnisse der Ausgrabungen am Beltempel zu Nippur. (Globus, Brnschw., 1903, LXXXIV, 133-137, 149-154, 6 figs.) Résumés the data in Hilprecht's *Explorations in Bible Lands during the 19th Century* (Phila., 1903).

Jenings (F. H.) Korean headdresses in the National Museum. (Smiths. Misc. Coll., Washington, 1903 [1904], Quart. Iss., I, 149-167, 22 figs.) Interesting account of hats and headdress in a country where "the people have hats for all occasions," and where "the hat is in fact a badge of honor and its absence a sign of disgrace." Butchers have been allowed to wear hats only since 1895 ; many styles have not changed since the time of Confucius. Hat pins, buttons, hat-boxes, etc., are also considered. Even in the house the Korean wears a gauze hat. There is also a hat-umbrella. Some of the hats show remarkable skill in horsehair-work. In Korea women are almost hatless (having only about half a dozen styles), but children have 12 styles and men about 65.

Koganei (A.) Ueber die Urbewohner von Japan. (Globus, Brnschw., 1903, LXXXIV, 101-106, 118-123.) Good critical résumé of recent literature on the primitive inhabitants of Japan and their remains, particularly the publications of

Tsuboi, who holds that the stone-age people of Japan and the modern Aino are nonrelated, the former or Koropokguru being rather akin to the Eskimo. Koganei is of opinion that the little group of North Kurile Aino on Shikotan are "a 'missing link' between the Stone-age Aino and the Iron-age Aino." The Koropokguru, if not a mythic people, were Aino, and the whole matter is to be summed up thus: Japan was once an Aino land.

Meyer (M.) Zur Theorie japanischer Musik. (Z. f. Psych., Leipzig, 1903, XXXIII, 289-306, 1 fig., 3 mus. ex.) Based on examples of Japanese music given in Abraham und Hornbostel's *Studien über das Tonssystem und die Musik der Japaner* (1903). Japanese melodic structure differs much from European. The 7 is rather frequent in the former. The "minor key" is also notable.

Myhrman (D. W.) Nya fynd i Babylon. (Ymer, Stockholm, 1903, XXIII, 269-297, 11 figs.) Résumé of the results of the German Oriental Society's excavations in the ruins of Hillah, 1899-1903.

INDONESIA, AUSTRALASIA, POLYNESIA

Ackerman (Jessie) Australia's native race. (So. Wknn., Hampton, Va., 1903, XXXII, 360-363.) Brief discussion of environment, life, social organization, food, weapons, marriage, etc.

Bouchal (L.) Indonesischer Zahlenglaube. (Globus, Brnschw., 1903, LXXXIV, 229-234.) This unusually well documented article treats of sacred numbers among the Indonesian peoples (Malays, Malagasy, Dyaks, Celebese, Sumatrans, Javans, etc.). Cosmology and cosmogony, mythology, legends, tales, soul-lore, magic, prophecy, love-charms, ceremonies of divers sorts, birth, pregnancy, menstruation, marriage, death and burial, etc., are considered. The numbers 3 and 7 are widespread, and the tribes who make much of 9 have a special word for it (not 10 minus 1 as other tribes), and such peoples seem to have other ethnographic parallels. Nowhere is 13 unlucky.

Flashman (J. F.) The evolution of the parieto-occipital fissure, as illustrated in some aboriginal brains. (Rep. Pathol.

Lab. Lun. Dept. N. S. W. Gov., Sydney, 1903, 1, 19-22, 2 pl.) Treats briefly of three aboriginal Australian and one adult (female) European brain. The author concludes that "the condition, as found in the Australian aborigines, contains all the factors for the production of the condition as found in the European; in fact, the former is the predecessor of the latter."

— Description of sulci of four brains of Australian aborigines. (Ibid., 23-48, 10 pl.) Details concerning brains of Joey Governor, a criminal; "Bob"; and two other males. The brain of Joey, in general, "presents no striking abnormality."

Forster (A.) Kurzer Bericht über das Muskelsystem einer Papua-Neugeborenen. (Anat. Anz., Jena, 1903, XXIV, 183-186.) Describes the muscular system of an 8-months-old Papuan child in comparison with European child of about the same age. Variability considerable. Face-musculature atavistic. Musculature in general not so fixed and not quite so differentiated as with the European child.

Gleason (R. P.) Industrial problems in the Philippines. (So. Wknn., Hampton, Va., 1903, XXXII, 529-535, 4 figs.) Averse to manual training in general, the Filipino takes best to things like telegraphy. In neatness, but not in accuracy of manual work, the Filipino boy exceeds the American. Here, as elsewhere "you can't hustle the East."

Jardim (J.) A ceramica em Timor. (Portugalia, Porto, 1903, 1, 823-825.) Describes briefly the manufacture of pottery by the natives of Baucan in Timor.

Moore (C. B.) The Boro Budur temple of Java. (Rec. of Past, Washington, 1903, II, 291-297, 4 ill.) Brief general description. The effect of these famous ruins is "amazing," and they are now easily accessible to the traveler.

Schmidt (E.) Ein angeblicher Beweis des tertiären Alters des Menschen in Australien. (Globus, Brnschw., 1903, LXXXIV, 288-289.) Critique of Alsborg's discussion of the human footprints and impress of buttocks in a sandstone block now in the Museum of Warrnambool, Victoria, and other alleged remains of Tertiary man (a worked bone, molars, etc.) from other parts of Australia.

Schmidt (W.) Beiträge zur Ethnographie des Gebietes von Potsdamhafen, Deutsch-Neuguinea. (Ibid., 76-81, 110-113, 123-127, 32 figs.) Describes, with discussion of native names and technical terms, signal drums, war-shields, "ancestral figures," masks, seats with heads, etc., from the Potsdamhafen region of German New Guinea. This valuable article is based chiefly on material collected by Father Vormann. The author, against von Luschan, excludes dream-figures as influencing the "figures of ancestors," and believes that the use of masks runs parallel with skull-cult.

Stangl (P. L.) The Tagalo as an American. (So. Wkmn., Hampton, Va., 1903, XXXII, 462-464.) Good traits are excellent as an artisan, teachability, capacity for progress, cautious (also very sensitive), domestic, religious, practical even in metaphysics, analytical, etc. Bad traits, vain, improvident, unvarnished, too credulous and confiding (after his confidence is won), quick-tempered. He has in him "the elements necessary to become a valuable member of the family of nations, whether as an American or otherwise."

von den Steinen (K.) Marquesanische Knotenschnüre. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 108-114, 9 figs.) Interesting account of knotted strings used by the priests of the Marquesas islands for mnemotechnic purposes, the technical terms and legends and songs connected with them. These knotted strings are chiefly used to ensure the remembrance of ancestral names and traditional verses, sentences, etc. Dr von den Steinen emphasizes the suggestive analogy of the Peruvian *quipus*.

AMERICA

Alford (T. W.) The Shawnees of the present. (So. Wkmn., Hampton, Va., 1903, XXXII, 385-386.) Impressions of a Shawnee, who has a very hopeful view of the condition of his people.

Ambrosetti (J. B.) Las grandes hachas ceremoniales del Patagonia, probablemente pillan tokis. (An. d. Mus. Nac. de Buenos Aires, 1903, IX, 41-51, 7 figs.) Describes several ceremonial stone axes from various parts of Patagonia, of the sort thought to be identical with the *pillan toki* of the Araucanian-Calcha-

quian region. Dr Ambrosetti considers them to be "votive axes," offered, *e. g.*, to Pillan, or other deities, and these Patagonian specimens were probably of like use.

— Los pucos pintados de rojo sobre blanco del valle de Yocavil. (Ibid., 357-369, 18 figs.) Treats of the two series of ornamentation (red on white) on the *pucos*, or hemispheroidal dishes from the Yocavil region, one of the most interesting developments of ancient Calchaquian art. The basis of the first sort is center-pointing triangles, of the second center-crossing lines combined with bird-faces at the edges. Only 16 of these *pucos* are in archeological collections (the National Museum of Buenos Aires has 10).

— Cuatro pictografías de la región Calchaquí. (An. d. l. Soc. Cien. Arg., Buenos Aires, 1903, LVI, 116-126, 5 figs.) Describes four pictographs from the Calchaqui region. One represents, probably, a petition by Indian hunters of the guanaco to their deity; another, more complicated, in which a great serpent and many human and animal figures appear, may be the résumé of some myth or ceremony relating to rain-making, etc. — the caverns near by may have been *kivas* — or some legend of Catequil, etc. These Calchaquian pictographs deserve special study, for they seem to have more definite intent about them than has much of the ordinary Amerindian picture-writing.

— I Calchaquí. (Boll. Soc. Geogr. Ital., Roma, 1903, repr., pp. 18, 4 figs.) Résumés data concerning the Calchaquí and their culture. Habitat, Peruvian knowledge, art, crania, mythology, etc., are briefly considered. Dr Ambrosetti calls attention to the parallelism between the Calchaquí and the Pueblo Indians of Arizona and New Mexico — environment, petroglyphs, ceramics and their ornamentation, stone and other implements, animal fetishes, masks, myths, symbolism, etc., of water and agriculture. These parallels might well be made the subject of a detailed and comprehensive monograph.

Baum (H. M.) The Cahokia mound. (Rec. of Past, Washington, 1903, II, 215-222, 10 figs.) General descriptive discussion. Dr Baum holds that the Cahokia mound could never have been

built by Indians, for while these erected burial mounds, their earliest efforts "are easily distinguished from the work of the Mound Builders, properly so-called." He also thinks that the further study of the crania of the American Mound Builders will show that they "differ as much from those of the historic American Indians as do those of the Asiatic Mound Builders from those of the present inhabitants of those countries." Justification for such opinion is hardly visible.

Carlton (F. T.) The growth of rural population. (Pop. Sci. Mo., N. Y., 1903, LXIV, 177-181.) Based on the U. S. censuses of 1890 and 1900. In the north central and New England States "the rural sections, taken as a whole, are not being depopulated, but are increasing in population at a gradually accelerated rate." Those nearer large cities show greatest gain.

Cattell (J. M.) Statistics of American psychologists (Amer. J. of Psych., Worcester, 1903, XIV, 310-328.) Gives interesting information as to fame and labor of the 200 working psychologists of America, who, on the average, "make a contribution of some importance only once in two or three years." Prof. Cattell now inclines to believe that "psychologists are born, not made."

Chamberlain (A. F.) Primitive taste-words. (Ibid., 146-153.) Discusses etymology and psychological bearings of general and particular (acid, astringent, bitter, peppermint, pungent, rancid, salt, sour, sweet) taste-words in various dialects of the Algonquian stock.

Diguet (L.) Le Chimalhuacan et ses populations avant la conquête espagnole. (J. de la Soc. d. Amér. de Paris, 1903, N. S. I, 1-57, 3 pl., 2 maps.) Historical and ethnographical account of pre-Spanish Chimalhuacan (Jalisco, Tepic, parts of Sinaloa, Zacatecas, and Aguas Calientes). Ethnic divisions, dress, arts and industries, agriculture, religion, political geography, and the course of the Spanish conquest are treated of. Based on Tello, Beaumont, Mota Padilla, Frejes, and Navarrete. Remnants of ancient costume, ceremonies, etc., still survive in Tuxpan, although the "ethnic character" of Chimalhuacan has almost entirely disappeared. A good paper.

Dissette (Mary E.) Signs of progress in Pueblo day schools. (So. Wkmn.,

Hampton, Va., 1903, XXXII, 465-472, 8 figs.) Among the signs of progress noted are "a disposition on the part of the Indians to provide better quarters for both teacher and pupils,"—observed in 9 villages; better equipment; rapid growth in the use of the English language; increasing regularity of attendance,—"our best day schools compare very favorably in this respect with the ordinary district school of the States." The Pueblo woman, who "rules the home and the children," is said to be "very much more conservative and non-progressive than the husband."

Dubois (Constance G.) The exiles of San Felipe. (Ibid., 607-610, 2 figs.) Treats of the enforced exile of the Hot Springs Indians of southern California. The condition of things at Pala is far from satisfactory.

Ellis (Leonora B.) The Seminoles of Florida. (Gunton's Mag., N. Y., 1903, xxv, 495-505.) General historical and ethnographic sketch—habitat, agriculture, arts and industries (*coontie*-starch making), dwellings, cooking (*sofkee*-stew), marriage, status of women, canoe-making, government, religion, whites and Indians. The author notes the great distrust shown by the Seminoles toward the Americans today.

Fehlinger (H.) Die Indianer Kanadas, (Globus, Brnschw., 1903, LXXXIV, 106-107.) Résumés governmental reports. Increase from 99,527 in 1901 to 108,112 in 1902, chiefly due to more complete enumeration.

Fewkes (J. W.) Preliminary report on an archeological trip to the West Indies. (Smiths. Misc. Coll., Washington, 1903, Quart. Iss., I, 112-133, 10 pl.) Résumés results of investigations of November, 1902, to May, 1903. After notes on excavations, cave exploration, collections, etc., Dr Fewkes describes stone implements (celts, chisels, balls, dishes, beads, mortars, rings, ornamented pestles), stone idols and amulets, stone disks with faces on one side, pottery, wood-carvings (cassava-graters, clubs, stools, serpents, idols, vomiting-sticks), shell and bone carvings, pictographs and rock-etchings. The importance of excavations in Porto Rican caves, village sites and dance enclosures (*juego de bola*) is apparent from the success met with at Utuado, where ten skeletons and several

skulls were recovered from "an Indian cemetery, the first of its kind ever found in Porto Rico." The collection brought back to Washington numbered over 1200 specimens. To the country people stone celts are *piedras de rayo*, or "thunder-stones." Dr Fewkes' expedition will add very much to our knowledge of the pre-Columbian Antilleans.

Förstemann (E.) *Inschriften von Yaxchilan.* (Ibid., 81-83.) Discusses the Maya inscriptions of Yaxchilan published by Maler, bearing dates, the author thinks, of 1384, 1412, 1455, and 1157 A. D., the last long before the beginning of Maya culture in its characteristic form. One of the inscriptions is a monument to some distinguished man, another is related to some cyclic event of importance.

Froideveaux (H.) *Nordenskjöld Américaniste.* (J. de la Soc. d. Amér. de Paris, 1903, N. S., 1, 81-83.) Brief account of the scientific labors of Baron Nordenskjöld, corresponding member of the Paris Society of Americanists.

— Guido Boggiani. (Ibid., 105-106.) Brief sketch of life and activities of Boggiani, the Italian ethnographer, killed in 1901 by the Toba Indians of the Gran Chaco.

Gleason (F. D.) A Sioux conference in a blizzard. (So. Wkmn., Hampton, Va., 1903, XXXII, 550-553.) Brief account of "mission meeting" of Dakota-speaking Indians at Standing Rock, N. Dak. Author contrasts the large attendance with the slim meetings of the whites in such weather.

Holmes (W. H.) Shell ornaments from Kentucky and Mexico. (Smiths. Misc. Coll., 1903 [1904], Quart. Iss., 1, 97-99, 2 pl., 1 fig.) Describes briefly a conch shell gorget from a burial place near Eddyville, Kentucky, in comparison with a similar gorget from Mexico, and an engraved piece of dark wood or bark from an ancient grave near Florence, Alabama. Professor Holmes thinks that the Kentucky figure "strongly suggests the idea that it must represent a disk-thrower engaged, possibly, in playing the well-known game of chungkee," while the resemblance of the bark figure "to certain delineations of spiders engraved on shell gorgets . . . is very marked."

Lejeal (L.) *Le Congrès de New York.* (J. de la Soc. d. Amér. de Paris, 1903, N. S., 1, 84-97.) Excellent appreciative résumé of the proceedings of the Congress of Americanists at New York, October 20-25, 1902. Wittily and pleasantly written, as one might expect from a French man of science and letters. M. Lejeal is not so much afraid of "Amerind" as were some who took part in the "logomachy" its use called forth. He also speaks of "the time-honored and luckless prejudice which makes the Old World the sole and necessary source of all civilization." The "Man of Lansing, brother of him of Trenton," hardly appeals to the author. Nor does Mr Farwell's treatment of Indian music.

— Thomas Wilson. (Ibid., 103-105.) Brief but very appreciative sketch of life and scientific activities.

León (N.) *Los Tarascos.* (Bol. d. Mus. Nac. de México, 1903, 2^a ep., 1, 153-169, 185-201, 217-233.) Continuation of valuable paper. Résumés and discusses, with reproduction of pictures, the *Relacion de Michuacan*, written 1570-1590, "the only known document giving us the primitive story of the Tarascos."

McLaughlin (A.) The bright side of Russian immigration. (Pop. Sci. Mo., N. Y., 1903, LXIV, 66-70.) Treats of Russian-Germans, Finns, Lithuanians, etc. Dr McLaughlin thinks "there is little to fear from these races properly inspected under our present laws."

Meerwarth (H.) *Zur Ethnographie der Paraguaygebiete und Matto Grosso.* (Globus, Brnschw., 1903, LXXXIV, 155-156.) Résumés the article of Koch.

— Aus dem Mündungsgebiet des Amazonas. *Der Campo der Insel Marajó.* (Ibid., 231-240, 250-255, 11 figs.) Based on travel in 1896-1898. Describes cattle-raising and the life of the inhabitants of the savanna country. Chiefly zoölogical.

Mélila (J.) *Théâtre d'animaux chez les Esquimaux.* (Rev. Scient., Paris, 1903, 4^e s., XX, 431-434.) Notes the large rôle played by animals with the Eskimo. Considers Eskimo dances, etc., in which men take the part of animals. Suggests *rapprochement* between the "animal pantomime" of the Eskimo and the

Chinese and Japanese paintings and sculptures, where "a like savage and humorous experience of animals has found definite expression."

Mitchell (S. C.) Proposed solutions of the negro problem. (So. Wkmn., Hampton, Va., 1903, XXXII, 545-550.) Discusses deportation, repression, moralization "by means of the slow and sure forces of education and religion." Last is best.

Nordenskiöld (E.) Om grafvar och boplatser i nordvästra Argentina från de s. k. Calchaquies. (Ymer, Stockholm, 1903, XXIII, 231-241, 9 figs.) Discusses from his own researches and those of ten Kate, Quiroga, Lafone Quevedo, Ambrosetti, etc., the dwelling places and graves of northwestern Argentina, their pottery, ornamentation, etc. This Calchaquian "half-civilization" is attracting more and more attention.

Northrop (Amanda C.) The successful women of America. Pop. Sci. Mo., N. Y., 1904, LXIV, 239-244.) Based on the 1902 edition of *Who's Who in America*. Statistics indicate that "college-training has played a small part in woman's success" (15.5 percent of the 954 individuals concerned). Co-educational institutions have a distinct advantage over separate woman's colleges, and private schools, seemingly, over public schools.

Pilcher (Louise H.) Indian town officers. (So. Wkmn., Hampton, Va., 1903, XXXII, 411-413.) Brief account of the officials of the Pueblo of Laguna, New Mexico, their duties and conduct — "the laws are more strictly enforced than in many white villages, and the Indian officials make better officers than do the Mexican ones in the nearby towns."

Plancarte (F.) y **León** (N.) Noticia de un dialecto nuevo del Matlaltzinca. (Bol. d. Mus. Nac. d. México, 1903, 2^a ep., I, 201-204.) Letter of Sr Plancarte containing vocabulary of 125 words, with comment by Dr León. Reports discovery of this dialect in San Francisco, near Temascaltepec. Dr León finds affinities with Ocuiltec, a Matlaltzinca language of the district of Tenancingo. The numerals of the new dialect are said to little resemble those of other Mexican languages.

Prud'homme (L.-A.) Les premiers aborigènes du Manitoba et du Nord-Ouest. (Rev. Canad., 1903, 262-176.) Treats briefly of Mandans, Sioux, Cree, Sauteux. *Outré* conclusions, — Mandans derived from northeast Asia, Sioux from Mongols, Crees and Sauteux from Scandinavians or Normans!

Rivet (M.) Étude sur les indiens de la région de Riobamba. (J. de la Soc. d. Amér. de Paris, 1903, N. S., I, 59-80.) Treats of physical characteristics, dress and ornament, houses, utensils, domestic animals, food and drink, disease, village life, marriage (quasi-indifference as to choice), birth, agriculture, work, division of labor (apegado, concierto, libre, suelto), religion, superstitions and prejudices, death-cult, etc. According to the author, La Condamine's description of these Indians a century ago "is still accurate in all points." They are chiefly barefoot, simply clothed, have few utensils or furniture, eat vermin, are largely frugal vegetarians, drink *chicha*, resist disease poorly, fear and hate the whites, are fetishistic and fanatic, mingling the heathen and the Christian, are born liars, less idle than indolent, home-loving, servants of sorcery, dreams, etc., and reflect in their deportment the centuries of humiliation and servitude they have undergone.

Seler (E.) Studien in den Ruinen von Yucatan. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 114-116.) General description accompanying a stereopticon lecture on the ruined cities of Yucatan, particularly Uxmal and Chichen-itzá.

— Eine andere mit Bestimmung versehene altmexikanische Steinmaske. (Globus. Brnschw., 1903, LXXXIV, 173-176, 4 figs.) Describes an ancient Mexican stone mask, on the inside of which are a representation of Quetzalcoatl and the name "Nine Wind," one of the appellations of this deity, by which as Oviedo records, he was known to the Nahuatl-speaking people of Teomega in Nicaragua.

Telford (Emma P.) Navaho games and handicrafts. So. Wkmn., Hampton, Va., 1903, XXXII, 369-375, 5 figs.) Brief account of weaving (effects of white influence noted) and annual games (on invitation of trader). Author takes an optimistic view of Navaho future.

Villada (M. M.) y León (N.) Informe sobre los fosiles de el rancho de "El Corte," Coahuila. (Bol. d. Mus. Nac. de Mexico, 1903, 2^a ep., 1, 169-178, 4 pl.) Report of the committee appointed by the Department of Justice and Education to investigate the alleged deposit of fossil human bones on the El Corte ranch at Ramos Arispe, in the state of Coahuila, Mexico. The remains turned out to be elephant bones, etc.

West (G. A.) Summary of the archeology of Racine county, Wisconsin. (Wisc. Archeol., Milwaukee, 1903, III, 6-42, 10 figs.) After geographical and historical introduction, the author treats of Indian trails, remains in the city of Racine and town of Mt Pleasant, towns of Caledonia, Raymond, Norway, Burlington, etc., and Racine county implements and ornaments. Racine county "has yielded to the archeological cabinets of the state and country rather more than its share of aboriginal implements and ornaments of clay, bone, horn, stone, copper, brass and iron." Evidences of

aboriginal trade and war relations between the Racine Indians and those of distant regions are furnished by the nature and the types of many of the objects. A rare specimen is an Iroquois pipe. The "Racine garden-beds," or Indian corn-fields, are of considerable interest. Dr Lapham and Dr Hay did much for the investigation of the mounds of Racine county.

Williams (T.) The fallacy of the "selected group" in the discussion of the Negro question. (So. Wkmm., Hampton, Va., 1903, XXXII, 520-526.) After pointing out that the mass of the ancestors of the American Negroes came from Congo valley, "from a point at which the Negro race, from climatic reasons, was, on the whole, at its lowest point of development," while about the western highlands they made much greater progress, concludes that in time they will also in America. To compare them as a group with the Anglo-Saxons of their present environment is fallacious.

ANTHROPOLOGIC MISCELLANEA

Preservation of Antiquities.—During the second session of the present (58th) Congress four different bills have been introduced, each having for its object the preservation of antiquities on the public lands of the United States. These bills differ in many respects; some apply only to government reservations, while others are insistent that the proposed law shall apply to all of the hundreds of millions of acres of the public domain.

The bills will be here referred to by the names of the members of Congress who originally introduced them. Mr Hitt's bill (H. R. 12,447) contains fourteen sections and has met the approval of the Board of Regents of the Smithsonian Institution. Its first section provides for the preservation of monuments, ruins, and other antiquities, and directs the President of the United States to declare lands containing ruins, etc., to be reservations whenever the public interest makes such action desirable. The bill declares all prehistoric artifacts to be the property of the government, and makes it unlawful for any one to collect such things on any of the reservations. Although the ownership of these objects is undoubted, it was thought advisable that, as they have from time out of mind been appropriated by anyone who desired to do so, the preserved objects should be enumerated. The reservations are left under control of the Secretary of the Interior, who is required to establish rules and regulations to govern them, provision being made in the bill to protect existing rights in grazing, mining, and quarrying, provided such do not conflict with the provisions of the proposed law. Permits under the act are authorized to be issued to all museums and educational institutions, and to foreign museums of national character, but not to private individuals. Foreign museums are placed under the restriction that they shall present the results of their excavations at Washington for inspection by officers of the Smithsonian Institution, who shall have the right to retain unique objects. All persons are required to prove, to the satisfaction of the Smithsonian Institution, their qualifications for conducting explorations before the Secretary of the Interior shall issue a permit. The permits cover a period of two years, with right of renewal, and no permit may be issued for work on a reservation while another permit covering the same area is

in force. Violation of the law is punishable by fine not exceeding \$500, or by imprisonment for not more than six months; informers are given one-half the fine. The Secretary of the Smithsonian Institution is directed to keep records of all permits issued, and of all monuments, ruins, and antiquities on government land; he is authorized to exchange objects with other museums, domestic or foreign, and those holding permits are required to make monthly returns, to the Smithsonian Institution, of the objects found, on blanks furnished for the purpose.

Mr Lacey's bill (H. R. 13,478) includes among the places to be reserved, those of scenic beauty, of natural wonder or curiosity, or springs with medicinal or other properties, in addition to the monuments, ruins, and antiquities enumerated in Mr Hitt's bill. These reservations are declared to be national parks; the Secretary of the Interior is to provide especially for their preservation, and is authorized to issue permits to any one in his discretion, provided the gatherings are made for the benefit of some museum or educational institution. The destruction of game, fish, or timber, or violation of the provisions of the law, is punishable by fine of from \$50 to \$5,000, or by imprisonment from fifteen days to one year, or both. In other respects, the Hitt and Lacey bills are generally similar. Friends of the Lacey bill contend that most of the provisions of the Hitt bill can be included in rules and regulations to be established under the Lacey bill.

Mr Rodey (by request) introduced a bill (H. R. 12,141) which authorizes permits to be issued for the removal from the public lands of anything in the nature of relics, ruins, etc., only on the recommendation of the university of the state or territory in which the ruins to be excavated are situated, and requires the filing of detail maps and photographs, of which two sets are to be deposited in the Bureau of American Ethnology. The bill further provides for a supervisor of all excavations, who is to be compensated by those holding the permit, and also requires photographs to be made of objects, both before and after their removal from the sites where found, and duplicates thereof are to be deposited in the university of the state or territory in which the objects are excavated. The term of imprisonment for violation of the requirements of the proposed law may be two years.

A fourth bill, introduced by Mr Rodenberg (H. R. 13,349), contains ten sections; it includes all public lands and authorizes the Secretary of the Interior to issue permits in his discretion. Reservations are directed to be created by act of Congress, on recommendation of the Secretary of the Interior, who is authorized to appoint custodians to pre-

vent excavations without permits, and to provide for their compensation until such time as Congress shall create the reservations. Isolated ruins are to be withheld from homestead preëmption until they shall have been excavated by some institution, and the Secretary of the Interior is required to issue permits for exploration when an application therefor is endorsed by the governor of the state or territory wherein the applicant is domiciled. Collections made by foreigners may be divided in the discretion of the Secretary of the Interior, the objects reserved to be deposited "in some public museum of the state or territory within which explorations are made." The bill requires the deposit of duplicate photographs in the U. S. National Museum, and provides punishment for the forgery or counterfeiting of any archeological object which derives value from its antiquity, etc. A fine not exceeding \$1,000, or imprisonment not exceeding one year, may be inflicted on anyone who carries away, without the authority of the Secretary of the Interior, any aboriginal antiquity on the public lands.

The several bills are pending before the Committees on the Public Lands of the House of Representatives and the Senate, respectively. Senate bill 4,127, introduced by Senator Cullom, is identical with the Hitt bill above mentioned.

The essential points of the bills here mentioned show their scope sufficiently to enable one to form an opinion of their relative worth. The photograph clause in the Rodey and Rodenberg bills would alone seem to be sufficient to make them unworthy of serious consideration, even did they contain no other objectionable features. A single expedition to the Southwest recently unearthed about 2,500 objects of antiquity, and as almost every specimen was found by itself, the duplicate photographs before and after excavation required by the bill would necessitate 5,000 negatives and 10,000 prints, to say nothing of the progress-photographs provided for.

A number of letters have been filed with the Committee on Public Lands of the House of Representatives, expressing the hope that Mr Rodenberg's bill would be enacted into law, although a large majority of them express favorable attitude toward the general purposes of the bill only.

A distinguished American anthropologist has filed with the committee a criticism of the Hitt, the Rodey, and the Rodenberg bills, and although he expresses preference for the Hitt bill, he does not think it wise to place the issuance of permits in the hands of the Smithsonian Institution, suggesting, in lieu of this provision, the creation of an archeological com-

mission, to which shall be submitted all applications for the issuance of permits, and which shall perform all the duties which, under the Hitt bill, are required of the Secretary of the Smithsonian Institution. He also does not believe the provision of the Hitt bill relating to foreign institutions to be a wise one, as their explorations must necessarily be insignificant; nor does he appear to advocate the monthly reports of objects collected. The Lacey bill had not been brought to the attention of this gentleman at the time he wrote.

At a recent hearing before the Committee on the Public Lands of the House of Representatives, at which representatives of the Smithsonian Institution were heard in advocacy of the Hitt bill (Mr Lacey's bill at that time not having been introduced), it was inferred, from questions asked by the committee, that exception might be taken to three points in the bill, as follows:

First. That it was unwise to require the Secretary of the Interior to issue a permit at the mandate of the Secretary of the Smithsonian Institution.

Second. That institutions of learning would resent being required to have their representatives examined by the Smithsonian Institution as to fitness before conducting excavations.

Third. That the requirement as to monthly reports would be unnecessarily burdensome.

The first objection may be met by requiring the institution applying for the permit to prove the fitness of its representative to the Smithsonian Institution, which, in turn, shall make recommendation to the Secretary of the Interior, who may then take such action as may be deemed proper.

The suggestion of an archeological commission to have charge of monuments, ruins, etc., would not only incur the objection brought forth in the hearing before the committee, above alluded to, but the creation of a new commission would add to the expense of administration. Nor does there appear to exist a valid reason why a non-governmental commission should be created for the purpose of administering purely governmental affairs when the machinery for such already exists. The writer herein referred to as having taken exception to the Hitt bill gives no reason why it would not be wise to place the administration of these affairs under the direction of the Smithsonian Institution, unless it be in a suggestion made by him that the Field Columbian Museum, the Peabody Museum at Cambridge, and the American Museum of Natural History could probably furnish better material from which to select a commission.

The objection to the manner of proving the fitness of those who conduct the excavations might readily be removed by requiring the control-

ling officers of the various institutions to certify to the Smithsonian Institution as to the fitness of those who are to conduct the excavations, that institution in turn to report to the Secretary of the Interior, who shall then act as he may deem best.

The suggestion that a monthly report would be burdensome may be practically obviated by making the reports quarterly.

It is much to be desired that something in the nature of one of these bills should be passed, especially as much material of interest and value to the archeology, ethnology, and early history of our country is constantly being excavated and sold to tourists and others, with no record of the circumstances attending their discovery. Every great nation has provided some protection for its monuments and antiquities, and the United States must soon do likewise.

JOSEPH D. MCGUIRE.

Anthropological Publications of La Plata Museum. — Since Dr Robert Lehmann-Nitsche, a German by birth and a pupil of Prof. J. Ranke in Munich, succeeded the undersigned as curator of the anthropological department of the Museo de La Plata in 1897, he has published, mostly in Spanish, a number of papers of anthropological importance, all of which have appeared in the *Revista del Museo*. As I shall refer only to those contributions which are either written in Spanish or have been published during the last two years, it may suffice to quote the titles of Dr Lehmann-Nitsche's previous studies: (1) *Lepra precolumbiana?*, (2) *Antropologia y craneologia*, (3) *Observations nouvelles sur les Indiens Guayaguis du Paraguay*, in tomo ix of the *Revista*, and (4) *Trois cranes, un trépané, un lésionné, un perforé*, in tomo x. The first and last mentioned papers are of great medical as well as of ethnological interest. It will be recalled that the question of precolumbian leprosy especially created much discussion a few years ago when Ashmead, Virchow, Polakowsky, Bloch, and others took an active part.

Grypotherium Darwinii (var. *domesticum*), a fossil edentate discovered several years ago in the Eberhardt cave, southwestern Patagonia, concerning which much has since been written, has been said to be still known in folktales and traditions of the Araucanians. Lehmann-Nitsche, however, in his paper *La pretendida existencia actual del Grypotherium* (*Revista*, tomo x, 1902, p. 269) proves that the mythical *Jemisch* or *Nürüfilu* is neither *Grypotherium* nor the fossil felid *Jemisch listai*, but is related to the otter and the tiger. Both *Grypotherium*¹ and *Jemisch*

¹Cf. *Zur Vorgeschichte der Entdeckung von Grypotherium bei Ultima Esperanza*, Berlin, 1901.

have been so long extinct that no name for them is traceable in the Indian languages and traditions.

In his paper *Nuevos objetos de industria humana encontrados le la caverna Eberhardt en Ultima Esperanza*, which, like all the following studies, appeared in tomo XI, 1903, of the *Revista*, Lehmann-Nitsche describes and figures a number of prehistoric objects found in the cave referred to and which would seem to prove the coëxistence of man and *Grypotherium*. This find consists of two bone implements, fragments of a flint knife, four pieces of tanned animal skin, a few human metacarpal and metatarsal bones, and the osseous remains of *Grypotherium*, *Canis avus*, *Onohippium*, etc. Interest in the occurrence of the *Grypotherium* bones is greatly enhanced by the fact that some of them have intentionally been broken and that they show signs of the action of fire. This seems to indicate that prehistoric man in these regions ate the flesh of *Grypotherium* and *Onohippium*, but Lehmann-Nitsche doubtless goes too far in surmising that this great sloth was domesticated by the cave-dwellers, since there is as yet no substantial evidence on which to base such a hypothesis.¹

The subject of another publication, *Hallazgos antropológicos de la caverna Markatsh Aiken*, is indirectly related to the finds in the Eberhardt cave. The objects (now in the Museo de La Plata) found by Hauthal in the cave of Markatsh Aiken, near the Rio Chico, southern Patagonia, and which form the subject of this brief paper, seem to belong to the same prehistoric period as those of the Eberhardt cave. Hauthal found on the bottom of this cave, in an apparently old layer of ashes, a bone awl, four rude stone implements of the "Moustérien" type, the fragments of a greatly decayed bow, and the semi-fossil tooth of an equid. The mummified skeleton of an Indian, which was exhumed previously by a settler, is unfortunately widely separated from the other finds, as it is now preserved in the Provincial Museum at Breslau.

A very welcome contribution to South American archeology is the richly illustrated *Catálogo de las antigüedades de la provincia de Jujuy conservadas en el Museo de La Plata*, for which Americanists ought to be thankful to Dr Lehmann-Nitsche. Archeological objects from Jujuy, in extreme northwestern Argentina, are very rare indeed in the museums of the world, for it seems that only La Plata and Berlin (Max Uhle collection) possess objects representing this ancient culture. The relics in question were exhumed from cemeteries, especially at Santa Catalina, Casabindo, Rio San Juan de Mayo, Surugá, and La Rinconada. They

¹ Cf. Hauthal, Roth, and Lehmann-Nitsche, *El mamífero misterioso de la Patagonia*, *Revista*, t. IX, 1899, p. 409; *Globus*, vol. 78, Nos. 21-22.

were procured partly by purchase and partly through collection in the field, and consist of a variety of objects: osseous remains, decorated and plain pottery, textile fabrics, implements and household utensils, and weapons. Among the last mentioned bows and painted arrows and a fine copper battle-axe are particularly interesting.

The uses to which many of these objects were put is not well known, and in some cases an interpretation seems practically impossible. Indeed, as there are no survivors of these ancient people, the study of the "desert culture" of Argentina is rendered much more difficult than that of southwestern United States.

Patalogia en la alfarería peruana is the title of a paper in which Lehmann-Nitsche discusses the question of the meaning of a clay figure representing a human being with a maimed leg. As lepra, lupus, or any other chronic disease, as well as any intentional deformation is out of the question, the most plausible solution is that the deformity represents the stump of a leg after partial amputation.¹ This piece of earthenware, which was formerly deposited in the La Plata Museum, was lately brought to the United States by its owner, Señor Don Martín García Mérou.

A rare case of congenital median fissure of the upper half of the face, found on a young Italian thief imprisoned at La Plata, is described and figured in Lehmann-Nitsche's paper *Un caso raro de hendidura media congenita*. The subject in question was more or less feeble-minded, querulous, and fickle. His parents and twelve brothers and sisters are said to have been normal.

In his study *Tipos de craneos y craneos de raza* Lehmann-Nitsche presents an opinion on the value of craniology notwithstanding the severe criticisms to which this branch of somatology has been subjected in late years. The chief purport of the paper is to show that the same human skull can belong to many different types according to sex, age, and race, not to speak of biological, pathological, individual, cultural, and other factors. We cannot now admit that there are any race skulls in the sense employed by Blumenbach, since increased knowledge based on extensive material enables us to distinguish a great many craniological types in one and the same race. As an example, Lehmann-Nitsche points out the great variety — *poikilotypy* — in the American race. There is no American race skull, but many varieties or subraces have their special types, *e. g.*, the Patagonians, Araucanians, Calchaquis, etc. These assertions are certainly not new, but their truths are too often disregarded.

¹ Cf. *Janus*, 7 Jahrg., 8 Liefer., and *Verhandl. der Berliner Anthropol. Gesellsch.*, Sitzungb. v. 25, Okt., 1902, in which the same subject is treated.

All the articles referred to are accompanied with excellent illustrations (for which the *Talleres del Museo* are justly famous); they likewise display thoroughness and scholarship. Consequently we may expect that the forthcoming results of Dr Lehmann-Nitsche's studies on fossil man in the Pampa formation and on the long neglected Araucanians will prove equally valuable to anthropology.

HERMAN TEN KATE.

John Eliot's Logic Primer.—The Burrows Brothers Company of Cleveland, Ohio, has just reprinted, from the unique original, *The Logic Primer* of John Eliot, printed at Cambridge, Massachusetts, in 1672, for the use of the Natick Indians. The little book contains an excellent introduction by Mr Wilberforce Eames of the Lenox Library, New York City, from which the following interesting account of Eliot and his work is extracted:

“The little book of which a reprint is offered now, for the first time, to the collector, is one of the rarest of early American publications. Only one copy is known to have survived the lapse of time, out of the edition of one thousand which was printed by Marmaduke Johnson at his press in Cambridge, Massachusetts, in 1672, and this one has strayed far from the place of its origin, being now preserved in the British Museum. . . . In 1889 the whole book was photographed, by permission of the authorities of the British Museum, at the expense of the late James C. Pilling, of the Bureau of Ethnology at Washington, in an edition of six copies, and from one of these photographic reproductions the present reprint is made.

“At the time when this book was first published, John Eliot had been engaged for twenty-six years in educational work among the Massachusetts Indians. He began to teach them in their own tongue in 1646, and he had translated into their language, and had run through the press, the whole Bible, two editions of a Catechism, a Primer, Baxter's *Call to the Unconverted*, Bayley's *Practice of Piety*, a grammar of the Indian language in English, and some minor publications. He was therefore well qualified by knowledge and experience for the undertaking of ‘a lecture in logic and theology,’ which he started at Natick in 1670. . . .

“The school of logic and theology at Natick flourished for several years under Mr Eliot's guiding care, until it was broken up by the fierce wars of 1675-76 with King Philip, sachem of Pokanoket and of all the Wampanoags. In this war many of the Bibles and other books were lost or destroyed by fire, and probably the *Logic Primer* suffered with the rest. At any rate, when the Indians had returned to Natick, and Mr Eliot had resumed his work among them there, he complained of the loss of books. After much delay, he obtained permission to have new editions

printed of the Bible and of some of the other Indian works. The *Logic Primer*, however, was not reprinted.

“Eighteen years after the publication of the book, Mr Eliot rested from his labors, May 21, 1690, in the eighty-sixth year of his age. From that time on, the Indian educational work rapidly declined, and soon came to an end altogether, while the Indian language itself became practically extinct before the end of the eighteenth century, the use of English having superseded it. Some remnants of the native tribes who were taught by Eliot still survive on the Indian reservations of Massachusetts, but they are now mostly of half-breed stock, having intermarried for many years with the negroes.”

Of special interest in connection with the work of the “Apostle to the Indians” is the *Natick Dictionary*, by the late Dr James Hammond Trumbull, published in 1903 by the Bureau of American Ethnology at Washington for gratuitous distribution to those interested in aboriginal American languages.

The Pomo in the Sacramento Valley of California.—In the last issue of the *Anthropologist* (pp. 729–730) it was stated that as a result of investigation by the Department of Anthropology of the University of California the two territories given in Powell’s *Indian Linguistic Families* as inhabited by the Pomo Indians must be reduced to one. In the course of investigations recently made in behalf of the Department on and about the headwaters of Stony creek in the vicinity of Stonyford, on the western side of Sacramento valley in Glenn and Colusa counties, California, it was ascertained that an isolated and comparatively small area in this region is inhabited by a people speaking a Pomo dialect. This territory was formerly regarded as forming part of the territory of the Wintun stock. It comprises only the drainage basin of the headwaters of Stony creek, or Big Stony creek as it is locally called, down to its confluence with Little Stony creek. On the east and south are people speaking a Wintun dialect. The boundary here follows the crest of the low ridge that separates the drainage of Big and Little Stony creeks, and then extends along a secondary ridge, on the northern slope of the divide south of Big Stony creek valley, as far as Snow mountain. On the west is the territory of the branch of the Yuki who held the headwaters of Rice fork of South Eel river, the boundary being the crest of Snow and Saint John mountains. On the north and northeast is spoken a second dialect of the Wintun, the boundary being a line from the southern end of Sheetiron mountain to the confluence of Big and Little Stony creeks. The general location of this detached branch of the Pomo is a

short distance to the northeast of the main Pomo territory, the nearest rancherias of which are those of the northern Clear Lake region and of Potter valley.

Considering that they are separated from all the remaining Pomo by Wintun and Yuki territory and by the main crest of the Coast Range, the language of the Stony Creek Pomo is not so divergent as might be expected. The dialect is quite distinct, but does not differ as much from certain of the other Pomo dialects as some of these differ from one another. It seems to differ less, on the whole, from the majority of Pomo dialects than does the dialect of the lower end of Clear lake.

Notwithstanding the fact that the Stony Creek Indians are Pomos, it would seem that they were formerly on more friendly terms with their nearer neighbors, the Yuki of Gravelly valley on South Eel river, than with any of the groups of their own linguistic family. These Yuki had certain hunting and food-gathering rights which were not enjoyed by others, and also had free access to the salt deposits within the Stony Creek territory. They occasionally intermarried with the Stony Creek Pomo.

S. A. BARRETT.

Method of Preparing Tesvino Among the White River Apaches. —

While measuring the White River Apaches (Hyde Expedition, 1900), I befriended an Indian named John Riley, one of the more intelligent English-speaking young men in the tribe, and one day, while visiting him, was invited to partake of some of the prohibited *tulipi* ("yellow water"), the Apache name for that which farther south is generally known as *tesvino*. This liquor, of which all present drank freely, was nearly of the color and consistency of whey, and of a slightly acid, rather pleasant taste. On inquiry I was given the following data concerning the history and preparation of the drink :

Tulipi was introduced among the White River Apaches, within the memory of men of middle age, by an old man of the tribe, still living in 1900, called "Brigham Young." It was brought from the more southerly Chiricahuas, who were said to have learned to make it in Mexico. In manufacturing it a woman takes some dry corn and soaks it over night in water; in the morning a hole is made in the ground, the bottom of which is thickly covered with yucca leaves, on which the corn is spread and covered with a gunnysack. The corn is then sprinkled once a day with warm water, until it begins to germinate, when it is allowed to grow under the sack until the sprouts are about two inches in height, which takes a week, more or less, according to the weather. The corn is next taken out and spread on a blanket, where it is left one day to partially

dry. On the next day two women grind the corn, one rough and one fine, and mix and knead it like dough. To about ten pounds of the dough are added, in a large earthen vessel, about four gallons of water. The whole is thoroughly stirred, then placed on the fire, and boiled down to about one-half the original quantity. During this boiling is added the "*tulipi* medicine" (to make the otherwise weak liquor intoxicating and exciting), composed of certain roots which I was afterward told were those of the loco weed, or jimson weed (*Datura meteloides*).

After the first boiling, enough water is added to make up for the loss, and the mixture is boiled for the second time, until reduced again by one-half. The liquid is then strained through a can with many perforations, cooled till luke-warm, and poured into the *tulipi* jug, a vessel used only for *tulipi*, and never washed. Finally some coarsely ground wheat is added and left floating on the surface, soon after which fermentation begins.

It is best to put the liquid into the *tulipi* jar and to add the wheat in the evening, for then the mixture is well fermented by morning and fit to drink at noon; but as it then rapidly increases in strength and acidity, to prevent spoiling it must be used on the first day after fermentation has commenced. If good *tulipi* is to be had, all these points must be well observed.

While under the influence of *tulipi* one becomes quarrelsome and irritable, and its use frequently results in brawls in which the participants are often severely maimed or killed. The "after effects" of excessive *tulipi* drinking are not serious — consisting mainly of headache and depression.

A. HRDLÍČKA.

Water Transportation by the Early Crows. — To prevent their ammunition, fire-arms, and other articles from getting wet, when crossing streams, the Crow Indians, many years ago, took as many buffalo hides as were thought necessary and placed them one upon another; around the entire edge of the bottom one a gathering string was run which, when drawn, caused the robes to assume a globular form. The articles to be kept dry were placed in it with a ballast of stone. By means of a line attached thereto, the skins were towed by hand when in shallow water, but as soon as water which would not permit of wading was reached, the end of the towing line was placed between the teeth of the tower, who swam with it until he reached shallow water or the shore.

Another method was to arrange and bind three poles in triangular form, over which a buffalo hide was spread and securely fastened at

intervals around its edges, as shown in fig. 1, *a*. Still another method, somewhat similar to that last described, was put to use. Instead of three poles being used, four were laid at right angles and bound at the points of crossing, and over this frame-work a buffalo hide was spread and fastened (fig. 1, *b*).

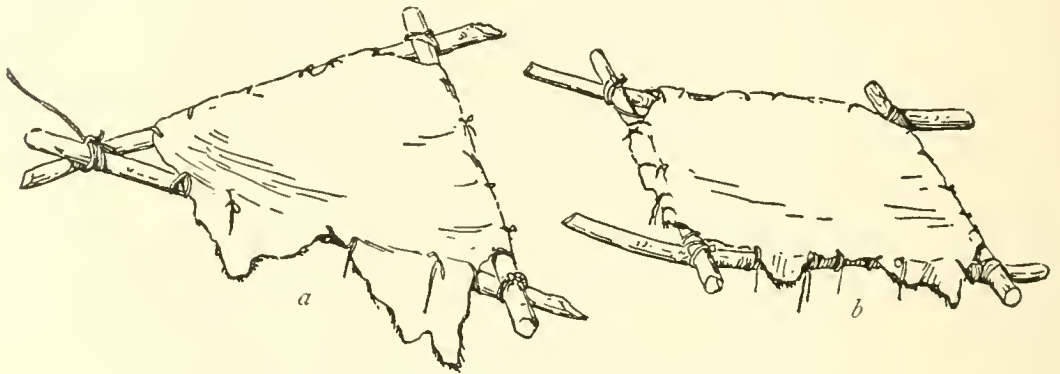


FIG. 1.—Baggage rafts of the Crow Indians.

The foregoing methods were usually employed by small parties, but when a large number with their paraphernalia and supplies desired to cross a stream, they took as many tipi poles as were necessary and fastened them lengthwise and parallel; over these the required number of buffalo hides were spread, and upon this improvised raft the cargo was placed. In all except the first method described, horses were used for towing.

S. C. SIMMS.

Iowa Anthropological Association. — On October 5 last a meeting of persons interested in anthropology was held at Iowa City, Iowa, for the purpose of considering the question of forming an Anthropological Association for the State of Iowa. Professor Samuel Calvin was elected chairman and Dr Duren J. H. Ward was chosen to act as secretary *pro tem*. After extended discussion as to the character of the association contemplated and to the character and sphere of kindred societies, the following constitution was adopted and signed by twenty-eight founders:

Believing that knowledge both of earlier and later men is now so far advanced as to render it possible to collect and systematize numerous archeological, biological, sociological, ethnical and historical facts, and wishing to coöperate in this important movement of Science;

Therefore, the undersigned unite to form THE IOWA ANTHROPOLOGICAL ASSOCIATION.

I. This Association shall have its headquarters at Iowa City, Iowa.

II. Its object shall be to promote the Science of Anthropology.

III. It shall hold a yearly meeting for the hearing of reports, papers, and projects, and for the election of officers. Other meetings may be arranged for and held from time to time.

IV. It shall elect a President, Vice-President, Secretary and Treasurer, and an Executive Board. The Executive Board shall consist of the President, Vice-President, Secretary, Treasurer, and five additional members. Five members of the Board shall constitute a quorum.

V. The Executive Board shall meet quarterly, and at the call of the President or on the request of two other members.

VI. The Executive Board shall publish the purposes, programs, reports, papers, etc., of the Association through whatever means it finds most practicable.

VII. Membership is obtained by the approval of the Executive Board, and the payment of one dollar annually.

VIII. This Charter Constitution may be amended at any annual meeting by a two-thirds' vote of the members present and voting, provided notice of the proposed amendment has been given in the call for the meeting.

After the adoption of the constitution Dr Ward was elected to the office of Secretary.

The second meeting was held October 17, when the following additional officers were elected: Samuel Calvin, president; J. H. Paarmann, vice-president; Frederick E. Bolton, treasurer; J. W. Rich, F. J. Becker, H. G. Plum, B. F. Shambaugh, and A. G. Smith, members of the executive board.

Early Western Travels.—The Arthur H. Clark Company, of Cleveland, Ohio, is about to publish a series of *Early Western Travels*, in thirty-one volumes, to comprise reprints of thirty-six distinct works, from Conrad Weiser's *Journal of a Tour to the Ohio* (1748) to Joel Parker's *Journal of Travels over the Rocky Mountains* (1847). The volumes are all of great historical and ethnological value, although in some cases it would seem questionable whether the originals are of sufficient rarity to warrant reprinting at the present time were it not that the new volumes are to be accompanied with historical, geographical, ethnological, and bibliographical notes and introductions, and an elaborate index (the last to form volume xxxi), by Mr Reuben Gold Thwaites, editor of the noteworthy *Jesuit Relations*. The series will contain facsimiles of the original title-pages, maps, portraits, views, etc., and will be sold at \$4.00 per volume, except the Maximilian Atlas, which is \$15.00. Besides those mentioned the series will include the narratives and journals of George Croghan, Charles Frederick Post, Captain Thomas Morris, J. Long, André and F. A. Michaux, Thaddeus Mason Harris, F. Cuming, John Bradbury, H. M. Brackenridge, Gabriel Franchère, Alexander Ross, Tilly Buttrick Jr., Estwick Evans, James Flint, Thomas Hulme, R. Flower, John Woods, W. Faux, Adlard Welby, Thomas Nuttall, Edwin James, James O. Pattie, George W. Ogden, W. Bullock, Josiah Gregg, John B.

Wyeth, John K. Townsend, Maximilian of Wied-Neuwied (including the fine Atlas), Edmund Flagg, Jean de Smet, and Thomas J. Farnham. Altogether the series of reprints will form an admirable library descriptive of the aborigines and the social and economic conditions of the Middle and Far West during the period of early American settlement.

The Navaho Yellow Dye. — In a paper bearing the title *Navajo Weavers*, published in the Third Annual Report of the Bureau of Ethnology (Washington, 1884), while describing the native dyes, I say: "There are, the Indians tell me, three different processes of dyeing yellow; two of these I have witnessed. . . . In the second process they use the large fleshy root of a plant which, as I have never yet seen it in fruit or flower, I am unable to determine,"—and then I describe the process of dyeing by means of this root.

Soon after this paper on *Navajo Weavers* appeared, I discovered that the plant in question was *Rumex hymenosepalum*; but I never announced my discovery in a way which would easily attract the attention of the ordinary investigator. Twenty years have passed since my paper was printed—years marked by a great increase of interest in the textile art of the Navahoes. Of late many articles, of varying degrees of merit, on this subject, have appeared in popular form. Some of the writers refer to this method of dyeing in yellow which I call the second method: but it seems that none of them has yet found out from what plant the dye-stuff is derived. Therefore I take this opportunity of informing those who may in future discuss the textile art of the Navahoes.

WASHINGTON MATTHEWS.

American Anthropology at the Universities of Germany. — Professor Johannes Ranke has recently published (*Corr.-Bl. d. deutschen Ges. f. Anthr.*, xxxiv, 53-59) a list of lectures and courses in Anthropology offered during the academic year 1902-03 at the universities of Germany, Austria, and Switzerland. The courses relating to America are as follows: F. VON LUSCHAN (Berlin): Ethnography of the South American Indians. E. SELER (Berlin): Mexican Grammar; Religion and Culture of the Mexicans. P. EHRENREICH (Berlin): The Hyperborean Peoples of America; Ethnography of North America (Select Chapters); General and Special Ethnography of South America. K. WEULE (Leipzig): The Aborigines of America. K. SAPPER (Tübingen): Ethnology and Ethnography of the Indian Stocks of Central America. E. BRÜCKNER (Berne): Geography and Ethnology of America, particularly North America.

A. F. C.

Augusto Carlos Teixeira de Aragão, who died May 3, 1903, aged 80, was a distinguished Portuguese man of letters and science — historian, numismatologist, archeologist, and Americanist, he was the author of many volumes. His greatest work is the three-volume study of the coins of Portugal and the Portuguese colonies. His last work, published in 1894, was *Diabruras santidades e prophcias*, characterized by Peixoto in *Portugalia* (I, 863) as a valuable historical and ethnographical contribution to the literature of religion. A man of varied tastes, his first publication (in 1846) was a now-forgotten novel. A. F. C.

Negroid Race in Armorica. — In a communication to the Angers (August, 1903) meeting of the Association Française pour l'Avancement des Sciences, M. G. Hervé described two neolithic Armorican skulls "of a negroid type," now in the museum of the Société d'Anthropologie de Paris. If this view is sustained, we have another proof of the existence of such a type in western Europe in primitive times, much farther to the north than is Mentone. A. F. C.

Conde de Ficalho. — In Count Ficalho, who died April 19, 1903, Portugal lost a lovable man of science and a useful citizen; a botanist and a man of letters. His *Plantas uteis da Africa Portuguesa* (Lisbon, 1884) is a valuable ethno-botanical study, following up his *Flora dos Lusíadas* (1880). He also published a magnificent critical edition of Garcia da Orta. In 1900 appeared his *Le Portugal au point de vue agricole*, a monograph not without ethnological content. A. F. C.

A Buriat Explorer. — The most successful, perhaps, of all those who have sought to discover the secrets of the famous city of Lhasa in Tibet is Sibikof, who stayed there about a year and when he left in 1901 had accumulated a mass of information, besides a large number of excellent photographs. It is interesting to know that Sibikof is a Buriat educated at the University of St Petersburg, and a Buddhist. A. F. C.

THE ETHNOLOGICAL SURVEY FOR THE PHILIPPINE ISLANDS will probably send to the St Louis Exposition the following groups of primitive people, who will live in houses of their own construction and pursue their daily social and industrial activities as far as possible in a natural way: the Negrito, the Bontoc-Igorot, the Lepanto Igorot, the Tinguian, all of Luzon; the Manguian of Mindoro, the Sulu Moro of Jolo, the Samal Moro, the Lanao Moro, and the Bogobo, all of Mindanao. There will be about thirty-five people in the form of families in each group. The exhibit to be made by the Ethnological Survey will be under the personal supervision of its director, Dr Albert Ernest Jenks.

DR MERTON L. MILLER, formerly of the University of Chicago, was appointed to the position of ethnologist in the Ethnological Survey for the Philippine Islands on January 1, 1904. Dr Miller, who had been associated with the Survey during the greater part of last year, has been engaged in field work for the purpose of gathering material for the Survey's exhibit at the St Louis Exposition.

L'HOMME PRÉHISTORIQUE. — A new French monthly journal (32 pp., 8°), bearing the title *L'Homme préhistorique — Revue mensuelle illustrée d'Archéologie et d'Anthropologie préhistoriques*, has been commenced under the editorship of Dr Chervin and A. de Mortillet. Messrs Schleicher Frères & C^{ie}, 15 Rue des Saints-Pères, Paris, are the publishers, and the subscription is eleven francs per annum. The October issue, recently come to hand, contains some excellent photographic illustrations, in color, of stone implements in the collection of M. Paul de Givenchy.

PROF. A. H. KEANE, B.A., F.R.G.S., of London, has had the honorary degree of Doctor of Laws conferred on him by the University of St Andrew's, N.B., for distinguished services in the fields of anthropology and ethnology. Professor Keane has just completed the manuscript of an *Anthropological A.B.C. of America*, comprising 5,000 entries of tribes and languages of the New World.

MR HENRY BALFOUR, M.A., of Trinity College, Oxford, has been elected to fellowship at Exeter College. Mr Balfour has been for some years curator of the Pitt-Rivers Museum; he is also president of the Anthropological Institute, and president-elect of the Anthropological section of the British Association, which will hold its seventy-fourth meeting at Cambridge, commencing August 17.

IT IS ANNOUNCED by *Science* that the Minister of Public Instruction and Fine Arts of France has conferred the degree of Officer of Public Instruction on Dr Lester F. Ward in recognition of his scientific work. This highest degree of the academic order is usually conferred only on persons who have for five years held the degree of Officer of the Academy.

THE MAX MÜLLER MEMORIAL FUND, which is to be held in trust by the University of Oxford for the promotion of learning and research in the history, archeology, languages, literature, and religion of ancient India, now amounts to about \$12,000.

DR GEORGE GRANT MACCURDY, of Yale University, has been elected secretary of the Connecticut Academy of Arts and Sciences.

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ABORIGINAL MYTHS AND TRADITIONS CONCERNING THE ISLAND OF TITICACA, BOLIVIA¹

By ADOLPH F. BANDELIER

The most authentic sources for aboriginal Indian traditions are songs, orations, and tales, known to the members of religious societies of which every Indian tribe has at least the rudiments. These societies sometimes preserve the most remote records, through oral transmission. The substance changes but little in the course of centuries, but the form may suffer modifications that distort the original picture or even shroud it almost completely.

On the Island of Titicaca the changes which its Indian population has undergone, and the promiscuous origin of the present inhabitants, make it very doubtful if any original folklore may still be found. Traces of esoteric clusters exist, but these were not originally from Titicaca. Their present members may have been born there, but their parents or grandparents resided elsewhere and their lore does not embody traditions from very remote periods.

Therefore, at the very inception of our stay on the Island of Titicaca we were assured that there was no trace of ancient folklore in the recollection of its inhabitants. Notwithstanding the partial truth of these assertions, we obtained several tales which, while liable to objections, still refer to pre-Spanish times and conditions. Insofar as their principal secrets of magic and their most important dances are concerned, the Indians of Titicaca acknowledge that they

¹ This paper is a part of a monograph on the islands of Titicaca and Koati, which will embody the results of explorations made for the American Museum of Natural History in Peru and Bolivia in 1895.

derived them from two points on the shore of the lake — Sampaya and Huaicho. It is therefore possible that the folklore concerning Titicaca is from one or the other of these two points, or from both. It is also possible that what the Indian of today gives as genuine traditions, were related to his ancestors by Spaniards and especially by priests, and from data preserved by writers of the sixteenth and seventeenth centuries. I shall record the few stories gathered by us, adverting at the same time that it was only little by little and with reluctance that the Indians became at all communicative on such topics. Their reticence might lead to the supposition that what they told contains some primitive elements.

The belief that, in times far beyond the distinct recollection of man, the sun first rose from the "Sacred Rock," or Titi-Kala, was expressed to us by several Indians on the island, one of whom, an aged blind man, also stated that the moon was created there. The large nodules of limonite, which are regarded as tracks of the sun and moon, bear some relation to this belief. One of our informants was an old wizard, who told us that "the sun rose into the heavens from the Sacred Rock, in the shape of a big flame." But he also added that "the sun was the child of a woman" whom he called "Mama-Ojllia, who was also the mother of Manco Capac." About the origin of the moon he professed to be ignorant.

"In very ancient times," said he, "the island was inhabited by gentlemen [*caballeros*] similar to the Viracochas, the name given to whites by the Indians today." Whence these "gentlemen" came he knew not. "They had intercourse with the women of the people, and the children were deposited in caves, where they were kept alive by water dripping from the rock of the ceiling. After a certain time the mothers went to look after their offspring and found them alive and well. These children, who had thus been exposed, became the *Inga-Ré* [Incas], and they drove out the gentlemen and held the island thereafter." Whither the expelled "Viracochas" retreated, the tale sayeth not. (1)* The narrator mentioned the names of two women who acquired some note on the island, one of whom he called "Maria-Ka," the other "Mama Chocuayllo." About the Incas he remembered the names of Manco Capac, Viracocha,

* See notes at the end of the article.

Huaynacapac, Roca, Huascar, and Atahualpa, saying of Huascar that the Spaniards killed him near the island.

In a subsequent conversation the wizard stated that Atahualpa lived on the island and Huascar at Cuzco, and that after the time of the "Inga-Ré" the lake once dried up so completely that people from Huaicho came over on foot and killed the "Chullpa" then living on Titicaca. From one or the other Indian we obtained at least partial confirmation of this. All seemed to agree that the sun had made its first appearance on the Sacred Rock, and that the "Inga-Ré" originated on the island.

While we were at the pueblo of Tiquina, the parish priest, Father Nicanor Vizcarra, recounted to us the following tale which had been related to him by an Indian from Copacavana :

"The peninsula of Copacavana was inhabited, prior to the time of the Incas, by a tribe of rude Indians who owned flocks of llamas. Among those whose duty it was to herd the animals was a dumb girl. Every evening the herders returned the flocks to the care of the chief of the tribe, but for several months the dumb girl failed to put in her appearance. The fact of the matter was that the girl had given birth to a male child in some cave on the peninsula, and had left the infant in care of a female deer. The fatherless boy grew up in that cave, his mother visiting him daily toward evening. This went on for a number of years, until at last somebody followed her stealthily. He saw her approach the cave. A boy rushed out of it and embraced her, and she returned his caresses. When this boy reached the age of manhood he begged his mother to give him a club and to make him three slings. With the aid of these weapons he soon grew to be very powerful, and this was the origin of the Incas."

This tale has a slight resemblance to the Montezuma story as told in New Mexico. (2) But the bringing up of the child in a cave, and with the assistance of a female deer, also recalls the story of Romulus and Remus. It is not impossible that the legend of the foundation of Rome had been related by priests to Indians whom they educated, as has been the case all over Spanish America. I have been more than once surprised at listening to Indian friends of mine, in New Mexico and Mexico, who could read and write, and to whom the curate or missionary had told bits of classical history. (3) While I am far from asserting that the story from

Copacavana has such an origin, it is well to bear in mind such a possibility. (4) The influences to which the Indian of Spanish America has been subjected during the last three and a half centuries have been such that we cannot expect to find many traditions that have not suffered in some manner or other from European ideas. It is among tales preserved by the earliest writers, who were in the country during or immediately after the conquest, that we may look for authentic and mostly unimpaired folklore ; and, probably also, to a certain extent, among the Indians of today, wherever we succeed in gaining their absolute confidence.

Gonzalo Fernandez de Oviedo y Valdés, royal chronicler and for many years an officer of high rank in some of the Spanish possessions of America, did not visit Peru, but he took special pains to ascertain from those who returned therefrom, immediately after the incident at Cajamarca, and in subsequent years, what they had learned about the country and its inhabitants. Among them were Diego de Molina, Alonzo de Montemayor, and other noted men of the time. While he does not specify his source in every case, it is plain that his information was always first-hand. His allusion to the history of the Inca tribe, while brief, has the merit of being, so far as is now known, the earliest that has been preserved.

Oviedo says of Cuzco : "To this land there came in ancient times [anciently], a great lord with a people they call Inga, and now they call themselves Big Ears [Orejones], and only the Supreme Lord they call Inga. . . . This lord they call Inga peopled the Cuzco." (5) This indicates that the first Spaniards who came in contact with the Peruvian Indians understood them to believe and say that the Incas were not originally from the valley of Cuzco.

Among those who participated in the conquest of Peru from the very beginning was Juan de Betanzos, who spent the rest of his life at Cuzco, having married an Indian girl from the Inca tribe. Part of his book is lost, but enough remains to afford valuable data. Betanzos concluded the work in 1551, after laboring for several years over translations from Spanish into Quichua, and vice versa, so that he was familiar with the Quichua language. (6) Such tasks could be performed only with the aid of Indians, and Betanzos, aside from the assistance rendered by his wife, enjoyed the great

advantage of intimate intercourse with natives conversant with ancient lore. These same advantages, however, exposed him to a serious danger, the same danger that lessened the value of works written half a century later by Indian writers in Mexico. His informants were Inca, hence they told only their side of the story, with a natural tendency to extol to the conquerors, whose favor they were beginning to court, the importance of their tribe and its culture. Even traditions and myths, when told by people thus influenced, suffer the loss of some of their purity. I shall have occasion to refer at length to an official Spanish investigation of Indian lore, in which Betanzos took part. Meanwhile he tells us :

“In ancient times, they say, the country and province of Peru was dark, having neither light nor day. In those times there were certain people in it, which people had a certain chief who commanded them, and to whom they were subjected. Of the name of that people and of the chief who commanded them they have no recollection. And in those times, when all was night in this land, they say that from a lagoon in this country of Peru, in the province called Collasuyo, came a chief whom they called Con Tici Viracocha, who, they say, had with him a certain number of people, which number they do not recollect. And after he had come out of this lagoon he went to a place near it, where today stands a village called Tiaguanaco, in this aforesaid province of the Collao ; and when he and his people were there, they say that at once, and unexpectedly, he made the sun and the day, and ordered the sun to move in the course in which it now moves ; and afterward, they say, he made the stars and the moon. Of this Con Tici Viracocha they relate that he had appeared once before, and on that occasion he made the heavens and the earth, leaving them in darkness, and that when he made the people who lived in darkness as aforesaid, this people did some sort of wrong to this Viracocha, and as he was angered by it he turned to come out again, as the first time, and those first people and their chief he converted into stones, in punishment for the anger they had caused him.”

Betanzos proceeds to relate how the aforesaid Viracocha made, at Tiahuanaco, men and women out of stones. His companions he told to scatter, and, pointing out to them the people he had created from the stones, said to them :

“These shall be called so and so, and will come out of such a spring in such a province, and will settle in it and grow and multiply there ;

and those will come out of such a cave and their name will be so and so, and they will settle in such a place ; and as I have them here painted and carved out of stone, so they shall come forth from springs and rivers, caves and heights, in the provinces I have told you and named ; and now you go in that direction (pointing to the rising sun) — indicating to each one the line which he had to travel.

“ With himself he kept only two of his followers ; the others started on their peregrination, in the direction assigned to them. Each one, as he came to the province designated, called out aloud : ‘ So and so, come forth and settle in this deserted region, for so it is ordered by the Con Tici Viracocha who made the world . ’ Thereupon the people would come out of the places foretold by the Viracocha. While these executed his commands in the direction of the east, the great Viracocha dispatched his two companions, one to the south and the other to the north, while he himself went to the northwest toward Cuzco. On his way he kept on peopling the country in the manner described, by creating men and women from rocks, springs, and rivers, and when he reached the site of Cuzco he caused to come forth a chief called by him Alcaviza, and also gave the place its name Cuzco. Con Tici Viracocha continued his journey as far as the coast of Ecuador, where his companions rejoined him. There they all began to walk together on the waters of the sea and disappeared.” (7)

Alcaviza settled the site of Cuzco, and after that settlement had been made, a cavern opened at a nearby place called Pacaritambo, and out of this cave came four men with their women. One of the men was called Ayar Mango, afterward called Manco Capac. Two of the others had a rather strange fate — one being immured alive in a cave and the other becoming an idol. Manco Capac, however, settled at Cuzco with Alcaviza, and through his shrewdness became the first chief of the tribe and the founder of the Incas. (8)

This tale shows every mark of genuine Indian tradition, so far as it can be when not told in the original language or in a literal rendering from the text. It may thus be summarized : (*a*) There were two successive creations, both by the same being, who is thought to have been a man with divine attributes or at least with creative faculties. (*b*) This creator and his followers, after the first creation, came out of Lake Titicaca and went to Tiahuanaco, where the second creation was effected by him. (*c*) The origin of the

Inca is represented as posterior to the first settlement of Cuzco and is not ascribed to a colonization or to a conquest.

Cieza de Leon was a contemporary of Betanzos, but went to Peru several years after the conquest. Nevertheless the information gathered by him is valuable, since it is not likely that at his time aboriginal traditions could have become contaminated with ideas imported from the Old World. In the first part of his *Crónica del Perú* he mentions a myth to the effect that after many years spent in darkness, the sun rose from the Island of Titicaca in great splendor; thenceforth this island was regarded as sacred, and the Inca reared on it a temple dedicated to "their sun." (9) In another place he says that one of the principal chiefs of the Collao went to the "lagoon of Titicaca, and met on its principal island white men with beards with whom he fought in such a manner as to succeed in killing them all." (10) It is not clear whether this applies to Titicaca or whether (since it seems to be a tradition of the "Collao") one of the large islands near Puno is meant. Amantaní and Capachica are quite as conspicuous as Titicaca, and the difference in size is insignificant. Should the event related be true, Cieza furnishes an approximate date for its occurrence, placing it during the term of office of the chief Viracocha, hence the invasion of Titicaca by the Collao would have occurred in the fourteenth century. (11)

In the second part of this *Crónica* Cieza is more detailed:

"Before the Incas ruled in these kingdoms and were known in them, the Indians tell another much more important thing than all the rest, for they affirm that for a long time they were without seeing the sun, and that suffering a great deal on that account, they prayed and made vows to those on whom they looked as their gods, begging them for the light of which they were deprived. And while this was going on the sun rose in great splendor from the Island of Titicaca, which is within this great lagoon of the Collao, so that all were delighted. And after this had happened, they say that from the part of midday there appeared and came a white man of large size who showed great authority and inspired veneration by his aspect and person; and that this man, of whom they say he had so much power that of heights he made levels and of plains great heights, creating springs in live rock. And as they recognized in him such power, they called him Maker of all Created Things, Beginning Thereof, Father of the Sun, for they say that besides these he performed

other and greater deeds, because he gave to men and animals their existence and that finally they derived from him great benefits." (12)

This being, the Indians, according to Cieza, call Ticiviracocha, also Tupaca and Aranuan or Arnauan. Regarding the islands he relates a tale that white men inhabited it, which white and "bearded people were killed by a chief called Cari, who had come from the valley of Coquimbo in Chile." (13) He also states that when Inca Viracocha was war-captain at Cuzco, he received messengers from the chiefs of the Collao, one of whom had waged war against the inhabitants of the islands of the lake and had come out victorious. (14) Cieza places the origin of the Inca at Pacaritampu also, and fairly agrees with Betanzos.

It will not be amiss to call attention to the fact that Cieza, while contemporary (he finished the manuscript of the *Crónicas* at Lima in 1550, a year before Betanzos concluded his book), had much less opportunity for intimate intercourse with the natives. He went to Peru when less than twenty years of age; four years later he was in Colombia, later returning to the coast of Peru only for a comparatively short time. Cieza was a precocious youth, and it is not impossible that the traditions were obtained by him from Betanzos or at least through his instrumentality. He was not familiar with the Quichua language, hence had to depend on such Spaniards as knew the idiom, or on Indians who understood sufficient Spanish to be able to interpret. (15)

While, in 1542, Cieza was writing the first part of his chronicle in the Spanish town of Cartago, in southern Colombia, the Licentiate Don Cristoval Vaca de Castro, who had subdued the rebellion of the younger Almagro and was de facto governor of Peru, instituted an official inquiry concerning the ancient lore of the Cuzco Indians, the results of which are contained in a document, published by the late Don Marcos Jiménez de la Espada, under the title *Discurso sobre la Descendencia y Gobierno de los Ingas*. Vaca de Castro, —

"pretending with great solicitude to ascertain the antiquity of the Indians of this kingdom and their origin, and whether they were natives of this land or had come from other parts, caused all the old Ingas and ancient men of Cuzco, and its surroundings to be called together and brought

before him, and informing himself from them as intended, not one replied satisfactorily, but each in a different way, according to his knowledge and without being able to give any other information than that all the Ingas were descendants of Mango Capac, who was the first Inga, without being able to give any other statement, as they disagreed among themselves. In this dilemma they said that all the past Ingas had their *quipocamayos*, as well of the origin and beginning as of the times and occurrences in the days of their chiefs. They related the coming to Cuzco of Challocochima and Quisquis, tyrannical captains for Ataovallpa Inga, who destroyed the country and killed all the *quipocamayos* that fell into their hands, saying that they had to begin anew with Ticcicapac Inga, as they called the Ataovallpa Inga. They named some who were still alive, but hidden in the woods from fear of the tyrants of the past. Forthwith Vaca de Castro sent for them, and there were brought before him four very old men.

“These *quipocamayos* were like historiographers, or accountants, and there had been many of them, and all agreed in their *quipos* and accounts. Their sole duty was to keep good reckoning by means of their *quipos*, as well of the origin and beginning of the Ingas in general as of each one in particular, from the day when he was born, and everything that occurred during the time of each of their chiefs. They were expected to give account and information about everything they were asked, to instruct their children in it and to keep them well informed and prepared, so that they would know the meaning of everything. To these men were given monthly rations for their sustenance, and of all kinds of food, and they were also furnished with women and servants, their sole occupation being to take care of their *quipos*, keeping them in order with the corresponding and truthful relation. Those that were brought before Vaca de Castro asked for time to prepare their *quipos*, which was granted, and they were kept apart from each other in order to see if they still agreed in their results and sayings. The supervision of this was given to parties of an inquisitive turn of mind, with Pedro Escalante as interpreter, an Indian versed in the Castilian tongue and also interpreter of Vaca de Castro, assisted by *Juan de Betanzos* [Italics are mine] and Francisco de Villacastin, residents of this city of Cuzco, persons who knew very well the general language of this kingdom, and who wrote down what was declared by means of the *quipos*.”

This document contains no information concerning times anterior to Manco Capac except that the aborigines lived as scattered tribes with little regard to polity. Such is the usual way in which a

conquering tribe speaks of the conquered and its condition. The Island of Titicaca is nowhere mentioned; the origin of Manco Capac is placed at Pacaritambo, he was the son of the sun, and came out of a window in the rock. (16)

Two of the *quipocamayos* made a separate statement to the effect that they were natives of Pacaritambo, and that their forefathers (also *quipocamayos*) had told them, enjoining absolute secrecy, that Manco Capac was the son of some chief of Pacaritambo who never knew his mother, for which reason his father always called him Child of the Sun. This the people at last took seriously, and his father, perceiving the advantage he might derive from it, and assisted by two medicine-men, improved it for extending the sway of his tribe. These two last-mentioned *quipocamayos* asserted further that, from the time of Manco Capac to the death of Huascar, four hundred and seventy-three years, of twelve lunar months each, had elapsed. (17)

We may ask, Why were only the first two *quipocamayos* regarded as genuine informants by Vaca de Castro and by those to whom he entrusted the investigation? The other two, who were *natives* of Pacaritambo, hence best acquainted with the traditions of the place, deserve more credit, since the first two also acknowledge that Manco Capac had his origin there. A comparison of the joint deposition of the four, with the testimony given separately by the two from Pacaritambo, shows that the first was an official story formulated by the wizards (for the keepers of knotted strings were a branch of medicine-men) and repeated from generation to generation until accepted among the people. Such is the way whenever the truth for some reason or other is deemed unfit for general knowledge. The statements of the two from Pacaritambo contain that truth, hence the *Discurso* is most instructive for a critical sifting of Indian tradition; it also shows that the story of Manco Capac has a basis of fact, since it became divested of mythical color as soon as told by those who really knew about it. (18)

The Island of Titicaca, as already stated, is not mentioned in the *Discurso*, neither in the joint nor in the separate testimony. Betanzos, however, who took such an active part in the investigation, mentions it in his book, he either having derived information about

it from sources foreign to the Inca tribe, or else (if the stories told Garcilasso de la Vega, and to which we shall soon come, are genuine) the connection of Titicaca island with Cuzco lore antedates the appearance of Manco Capac by a long period. The investigations made by direction of Vaca de Castro were for the special purpose of finding out about the Inca, and the Indians confined their replies to what they were asked. That the four old men said nothing of Titicaca is not absolute proof that the island was unknown to them or that it played no part in their recollection of historical events.

Another contemporary of Betanzos was the royal accountant Agustin de Zárate, who came to Peru in 1543 and published in 1555 a *Historia del Descubrimiento y Conquista de la Provincia del Perú*, basing what he says of the conquest on the testimony of eye-witnesses. From what source he obtained the data on ancient traditions is not stated, and this is the more to be regretted as they differ in several respects from the information imparted by all other chroniclers and historians. Zárate says :

“In all the provinces of Peru there were principal chiefs, called in their language *curacas*. . . . These chiefs kept their Indians at peace, and were their captains in the wars which they waged against their neighbors, without there being a chief for the whole until, from the direction of the Collao, from a great lagoon called Titicaca (which is there), that has eighty leagues in circumference, there came a very warlike people whom they called Ingas. These go with their hair cut short and their ears perforated, and with round pieces of gold in the holes that still more enlarge them. . . . They call themselves *Ringrim*, signifying ear. And the principal one of them they named *Zapalla Inga*, which is ‘only chief,’ although some claim that they called him *Viracocha Inga*. The latter is to say ‘foam or grease of the sea,’ for as they did not know from what land they came, they fancied he had originated in that lagoon. . . . These Ingas began to settle the city of Cuzco.” (19)

Pedro Pizarro came to Peru with Francisco, his relative, took part in the conquest, and saw ancient Peruvian society in its pristine state, for he remained in the country and had excellent opportunities to learn. The brief notice in his *Relacion del Descubrimiento* about the Incas and their origin is not without interest: (20)

“These Indians say that an Inga was the first lord. Some say he came from the Island of Titicaca, which is an island in a lagoon of the Collao. . . . Other Indians claim that this first chief came forth at Tambo. This Tambo is in Condesuios, six leagues, more or less, from Cuzco.”

These few words embody the substance of the statements of Betanzos and Cieza of Leon.

Cieza gives as one of the main sources from which he derived his information, ancient songs of the natives. (21) It might be asked, How could he, whose stay at Cuzco and in southern Peru was comparatively short, have obtained sufficient knowledge of Quichua to enable him to interpret such archaic lore? Hence it is very likely that what he has preserved is second-hand, in so far as that the lore was imparted to him by such of his countrymen as had become thoroughly acquainted with the language and with the native interpretations of traditions regarded as authentic.

But, about thirty years after the date of the sources above considered, there appeared an investigator of Inca lore whose opportunities were as good as those of Betanzos and superior to those enjoyed by Cieza. This author is Father Cristóval de Molina, who resided at Cuzco between the years 1570 and 1584 as parish priest of the hospital originally founded for the exclusive benefit of the natives and afterward converted into a municipal infirmary, regardless of race or color. Father Molina, in his treatise entitled *Relacion de las fábulas y ritos de los Yngas* (of which only the translation by Sir Clements R. Markham is now at my command), treats at length of the ancient lore of the Cuzco tribe. He says: (22)

“And first with regard to the origin of their idolatries, it is so that those people had no knowledge of writing. But in a house of the Sun called Poquen-Cancha, which is near Cuzco, they had the life of each one of the Yncas, with the land they conquered, painted with figures on certain boards, and also their origin. Among these paintings the following fable was represented:

“In the life of Manco Ccapac, who was the first Ynca and from whom they began to be called Children of the Sun and to worship the Sun, they had a full account of the deluge. They say that all people and all created things perished in it, in as far as the water rose above all the highest mountains in the world. No living things survived except a man

and a woman, who remained in a box, and when the waters subsided, the wind carried them to Huánaco, which will be over seventy leagues from Cuzco, a little more or less. The creator of all things commanded them to remain there as Mitimas, and there in Tiahuanaco the creator began to raise up the people and nations that are in that region, making one of each nation of clay and painting the dresses that each one was to wear, those that were to wear their hair, with hair, and those that were to be shorn, with their hair cut; and to each nation was given the language that was to be spoken, and the songs to be sung, and the seeds and food they were to sow. When the creator had finished painting and making the said nations and figures of clay, he gave life and soul to each one, men as well as women, and ordered that they pass under the earth. Thence each nation came forth up in the places to which he ordered them to go. Thus they say that some came out of caves, others issued from hills, others from fountains, others from the trunks of trees. From this cause, and owing to having come forth and commenced to multiply, from those places, and to having had the beginning of their lineage in them, they made *huacas* and places of worship of them in memory of the origin of their lineage which proceeded from them. Thus each nation uses the dress with which they invest their *huacas*, and they say that the first that was born from that place were there turned into stones; others say the first of their lineage were turned into falcons, condors, and other animals and birds. Hence the *huacas* they use and worship are in different shapes. . . .

“They say that the Creator was in Tiahuanaco and that there was his chief abode, hence the superb edifices — worthy of admiration, in that place. On these edifices were painted many dresses of Indians, and there were many stones in the shape of men and women who had been changed into those for not obeying the commands of the Creator. They say that it was dark, and that there he made the sun, the moon, and stars, and that he ordered the sun, moon, and stars to go to the Island of Titicaca, which is near at hand, and thence to rise to heaven. They also declare that when the sun in the form of a man was ascending into heaven, very brilliant, it called to the Incas and to Manco Ccapac as their chief, and said: ‘Thou and thy descendants are to be Lords and are to subjugate many nations. Look upon me as thy father and thou shalt be my children and thou shalt worship me as thy father.’ And with these words it gave to Manco Ccapac for his insignia and arms the *suntur paucar* and the *champi* and the other insignia that are used by the Incas like scepters. And at that point the sun and moon and stars were commanded to ascend to heaven and to fix themselves in their place, and they did so.

At the same instant Manco Ccapac and his brothers and sisters, by command of the Creator, descended under the earth and came out again at the cave of Paccari-Tambo, though they say that other nations also came out of the same cave, at the point where the sun rose on the first day, after the Creator had divided the night from the day. Thus it was that they were called Children of the Sun, and that the Sun was worshipped and revered as a father.

“They also have another fable in which they say the Creator had two sons, the one called Ymaymana Viracocha and the other Tocapo Viracocha. Having completed the tribes and nations and assigned dresses and languages to them, the Creator sent the sun up to heaven, with the moon and stars each in its place. The Creator, who in the language of the Indians is called Pachayachi and Tecsiviracocha, which means the incomprehensible God, then went by the road of the mountains from Tiahuanaco, visiting and beholding all the nations and determining how they had begun to multiply and how to comply with his commands. He found that some natives had rebelled and had not obeyed his commands; so he turned a large number of them into stones of the shape of men and women, with the same dress they had worn. These conversions into stone were made at the following places: Tiahuanaco, Pucara, and Xauxa, where they say he turned the *huaca* called *Huarivilca* into stone, and in Pachacamac, and Cajamarca, and in other parts. In truth there are great blocks of stone in those places, some of which are nearly the size of giants. They must have been made by human hands in very ancient times; and by reason of the loss of memory and the absence of writing, they invented this fable, saying that people had been turned into stones for their disobedience, by command of the Creator. They also relate that in Pucara, which is forty leagues from the city of Cuzco, on the Collao road, fire came down from heaven and destroyed a great part of the people, while those who were taking to flight were turned into stones.

“The Creator, who is said to be the father of Ymaymana Viracocha and Tocapo Viracocha, commanded that the elder Ymaymana Viracocha, in whose power all things were placed, should set out from the point and go by way of the mountains and forests through all the land, giving names to the large and small trees and to the flowers and fruits that they bear, and teaching the people which ones were good for food or for medicine and which should be avoided. He also gave names to all the herbs and explained which had healing virtues and which were poisonous. The other son, Tocapo Viracocha, which means in their language ‘the maker,’

was ordered to go by way of the plains, visiting the people and giving names to the rivers and trees, and instructions respecting the fruits and flowers. Thus they went on until they reached the sea, whence they ascended to heaven, after having accomplished all they had to do in this world."

The deep impression rapidly made by biblical tales on the imagination of the Indians, through teachings of the Catholic church, is perceivable in many of the traditions reported by Molina. They do not, in the main, conflict with those of Betanzos, but they are more detailed and contain additions made since the advent of the Spaniards. A comparison of the material gathered by Molina with the declaration of the wizards from Pacaritambo in 1542 again shows that the former repeated an "official" story, not authentic recollections preserved by "keepers of the faith."

That which is of direct importance in our investigations lies in the tale about Manco Capac and the Island of Titicaca. According to Molina the former was created either at Tiahuanaco or on the island, — at all events at some place in or near the lake, — and was sent from there to Cuzco so as to appear at Pacaritambo through some miracle. It is also proper to call attention to the statement: "though they say that other nations also came out of the same cave, at the *point where the sun rose on the first day, after the creator had divided the night from the day.*" I italicize these words since they indicate a belief that not the Inca alone originated on Titicaca island.

Garcilasso de la Vega was born at Cuzco and has the right of calling himself an Inca, since, while his father was a Spaniard, his mother was an Inca girl. He lived at Cuzco until 1560, when he went to Spain. Garcilasso was twenty years of age when he left Peru, until which time he had been in constant and close contact with his mother's Indian relatives. Of the sources from which he gathered his knowledge he speaks as follows:

"It struck me that the best plan and way was to relate what, in my childhood, I heard many times from my mother, and from her sisters and uncles, and from other and elder people, about their origin and beginning. . . . My mother residing in Cuzco, her home, there came to visit her nearly every week the few relatives, male and female, who had sur-

vived the cruelty of Atauhualpa. During these visits their usual conversation was about the origin of their kings, of their supremacy, of the greatness of their empire, of their conquests and great deeds in governing, in war as well as in the laws which they made, so beneficial to their vassals."

One old man in particular gave him much information :

"During these discourses, I, who was a boy, often ran in and out, amusing myself with fragments of the story, as children do with the tales of nurses. In this manner, days and months and years passed until I had come to be sixteen or seventeen years of age. Being one day present with my kindred, who were discoursing of their kings and ancestors, it came into my mind to ask the most elderly person amongst them, and interrupted his discourse in this manner: 'Inca,' said I, 'and my uncle, how is it possible, since you have no writings, that you have been able to preserve the memory of things past, and of the original of our kings?'"

This aged Indian, whom he thus addressed and who afterward became his chief informant, made the following statement in regard to the origin of the Inca :

"You must know, therefore, that in ages past all this region and country you see around us was nothing but mountains and wild forests, and the people in those times were like so many beasts, without religion or government: they neither sowed, nor ploughed, nor clothed themselves, because they knew not the art of weaving with cotton or with wool. . . . In short, they were altogether savage, making use of such of their women as they accidentally met, understanding no propriety, or single enjoyment of it.

"Our Father the Sun, beholding men such as before related, took compassion on them, and sent a son and a daughter of his own from heaven to earth to instruct our people in the knowledge of Our Father the Sun, that they might worship and adore him and esteem him for their God, giving them laws and precepts whereunto they might conform their lives, like men of reason and civility. . . . With these orders and instructions Our Father the Sun placed his two children in Lake Titicaca, which is about eighty leagues hence, giving them liberty to go to and travel wherever they pleased; and in whatsoever place they stayed to eat or sleep, they should strike into the ground a little wedge of gold which he had given them, being about half a yard long, and two fingers thick, and where with one stroke this wedge would sink into the earth, there should be the place of their habitation and the court unto which all people should

resort. . . . Thus Our Father the Sun, having declared his pleasure to these, his two children, he despatched them from him, and taking their journey from Titicaca northward, at every place where they came to repose they tried to strike their wedge into the ground, but it took no place, nor would it enter. At length they came to a poor inn, or place wherein to rest, about seven or eight leagues southward from this city, which to this day is called Pacarec Tampu, which is as much as to say, "The Shining or Illuminated Dormitory." This is one of those colonies which the Prince planted, the inhabitants whereof boast of this name and title which our Inca bestowed upon it; whence he and his queen descended to the valley of Cozco, which was then only a wild and barren mountain. . . .

"This was the relation made to me by this Inca, brother of my mother, concerning the origin of the kings of this country. I afterward tried to translate it faithfully from my mother-tongue, which is the Inca, into Spanish." (23)

Garcilasso does not confine himself to Inca folklore, but relates traditions of other Peruvian tribes:

"Having to report the most current opinions touching the origin of the Inca kings, I will say that most of the people of Peru, that is the Indians from south of Cozco, what they call Collasuyu, and those in the west, called Cuntisuyu, tell about it a very pleasing fable. In order to make it more authoritative through time [antiquity], they say it happened after the deluge, of which they know nothing beyond that it really took place. . . . Thus they say that after the waters of the deluge had subsided, a certain man appeared in the country of Tiahuanacu, which is to the south of Cuzco; this man was so powerful that he divided the world into four parts, and gave them to four men whom he honored each with the title of king, the first of which was called Manco Capac, the second Colla, the third Tocay, and the fourth Pinahua. To this they add that he gave the northern part to Manco Capac, that of the south to Colla (after whom that great province has ever since been called), to Tocay that in the east, and to Pinahua that of the west. They further assert that, after having thus favored them, he sent each one to the land pertaining to him, to conquer and govern all the people there found.

"The Indians who live east and north of the town of Cuzco report another origin of the Incas, similar to the preceding. For they say that in the beginning of the world four men and four women, who were brothers and sisters, came out of the windows in certain rocks that are near the city, in a place called Paucartampu. These windows, they add,

were three in number, and only the one in the middle served for the sally of these people. Indeed it was afterward called the Royal Window, and for that reason was covered on all sides with large plates of gold, with a great quantity of precious stones inserted. The windows on both sides were also garnished with gold, but without jewels. The first of these brothers is called by them Manco Capac, and his wife Mama Ocllo. They believe that this one was the founder of this town." (24)

These tales, not being of direct Inca origin, Garcilasso treats as silly fables. It is readily observed that they are the same as some of those given by Betanzos and Cieza. Taking into consideration that Garcilasso was very young when he heard the aged Inca relate his version of the origin of the tribe, it appears likely that the old man adapted his story to the age of the listener. An Indian of experience will never disclose such matters in their real aspect to younger men, unless their discretion should have stood an exceptionally severe test.

While disparaging the merits of traditionary tales of extra-Incan tribes, Garcilasso acknowledges their genuineness, thus supporting Betanzos and Cieza. He began to pay attention to talk about the past of his mother's tribe not ten years after his two predecessors had concluded their manuscripts, hence his information dates from the same period as theirs, as well as from that of the depositions collected by direction of Vaca de Castro in 1542.

But Garcilasso acknowledges that much of his knowledge was derived from other sources. The writings of Father Blas Valera, partly destroyed at the capture of Cadiz by the English, are quoted by him (25), and he also mentions the *quipus* as useful to a certain extent, for he claims to have been able to interpret them.

Although a digression, I cannot refrain from quoting here what Garcilasso says of these knotted strings, since a statement from him has the double merit of coming from one strongly inclined to enhance the achievements of the aborigines, and who at the same time was practically familiar (or at least claimed to be) with the manipulation of the *quipus*:

"In a word, in these knots were embraced all things that could be computed by numbers, as far as to note the number of battles and encounters, of the embassies on the part of the Inca and the declaration the

king had given. But by these knots it was not possible to express the contents of the message, the express words of the declarations, and such other historic events, for these things consisted of terms uttered in speech or in writing, and the knots marked indeed the number but not the word. To remedy this defect they had also certain signs by which they recognized memorable actions, embassies, and declarations made in times of peace or war; the *quipucamayus* learned their substance by heart and taught them one to another by tradition. . . .”

He then mentions the *Amautas* and *Aravicus*, Indians who wove folklore into popular tales, giving them “a fabulous and allegorical” meaning; and continues:

“Nevertheless, all these things, as experience shows it, could serve only for a time in order to cause their exploits to be spoken of, since great deeds can be immortalized only by means of letters; but as the Incas had no knowledge of them, they used in their stead all they could invent that was most appropriate to their object.

“The Indians looked upon these things as sacred. As they had no knowledge of letters, they did all they could to prevent them from escaping their memory, for any Indian who had not learned by tradition their accounts or their histories, found himself as ignorant as a Spaniard or any other stranger. I had occasion, in my youth, to become learned in the art of managing these knots. When the Indians, my father’s subjects, and the other *curacas* came to town on Saint John’s day to pay their tribute, they begged my mother to command me to revise their *quipus*, for, being of a suspicious nature, they did not like the Spaniards to handle them; the which I did with pleasure, collating them with their knots to see that they conformed with the tribute they brought, so that by dint of handling them I became as proficient as they themselves.” (26)

This statement, from such a source, shows conclusively what little justification there was for basing authentic lore on the knotted strings.

Garcilasso acknowledges still another source — a series of writings and paintings, sent to him while in Spain with a letter dated April 16, 1603, and written for some descendants of the Inca tribe for the purpose of obtaining special favors from the crown. The paintings represented the past of the Inca tribe from the time of Manco Capac, with pictorial representations of costumes and with genealogical tables. Garcilasso does not say whether in these paint-

ings reference is found to Titicaca island. He does not appear to place great stress on these sources, or else they only repeated his own statements. He also says that, after reaching Spain, he remained in correspondence with his schoolmates at Cuzco, who furnished him a number of traditions, mostly on events of a later date. (27) In regard of the Island of Titicaca the following statement by Garcilasso should not pass without notice :

“What we have said about the Inca coming out of a marsh called Titicaca is confirmed by Francisco Lopez de Gomara. [Here follow quotations from the works of Zárate and Acosta.] It can be seen that what I have said of it is not new, and that I have but expanded the relations given of it by the Spaniards. In my capacity as a native Indian I must know better the genius of my language, and I have so to say, drank the truth, as well as the fables, which I relate.” (28)

At the time Father Cristóval Molina began his ecclesiastical career at Cuzco, in 1570-72, the Viceroy, Don Francisco de Toledo, instituted an official inquiry into the antiquities of the Cuzco Indians, after the manner of that made by Vaca de Castro in 1542. (29) For the purpose of illustrating their statements, the Indians painted, on a number of pieces of cloth, representations of events and customs of bygone days. A large number of witnesses were examined, not only from Cuzco, but of other tribes, and they agreed that Cuzco was already settled when Manco Capac (who is generally, though not always, designated as the first Inca) made his appearance there. (30) No direct mention is made of Titicaca island, but one of the witnesses, a man of note among the coast Indians and those of Cañar and Chachapoyas, said that Manco Capac had come out of a Rock of Lead. In the Quichua language *Titi* means “lead,” or “tin,” and one of the definitions of the word *Titicaca* is based on this utterly groundless etymology. (31)

Referring to the four paintings on cloth illustrating ancient history of the Inca, it is said that on the first were painted the legends concerning events that occurred at Tambotocco and the “fables of the creations of Viracocha.” These four paintings on cloth recall those on boards which are said by Molina to have existed in an old shrine of “the sun” near Cuzco. If it should be ascertained that both were the same, it would impair the value of that which Molina

bases thereon. The paintings "on cloth" may have been copies of those on boards. It is singular that none of the other sources, anterior, contemporaneous, or subsequent, mentions the painted boards, and it should also be noted that the investigation ordered by Toledo coincides in date with the beginning of Molina's ecclesiastical career at Cuzco.

Miguel Cabello Balboa came to Peru in 1566 and finished his *Miscelánea austral* at Lima twenty years later. He places the origin of the Inca at Pacari Tampu, identifying the site with Tambo Tocco; but he adds: "Many Indians pretend that the brothers who appeared at Pacari Tambo . . . were natives of Titicaca, and that in that place were manufactured the garments in which they showed themselves for the first time." He explains the first appearance of Manco Capac and his relatives, all in garments bright with silver and gold — a cunning artifice for bringing the natives of Cuzco to peaceable submission. According to him the little band of adventurers traveled at night and hid in the day time, presenting themselves unexpectedly a short distance from Cuzco, arrayed in gorgeous vestments. (32)

The Jesuit Joseph de Acosta resided in Peru from 1569 to 1585. (33) His book, less prolix than is usual for the time, is of great value. He mentions the investigations instituted by Toledo and by the order of the King of Spain (34), and it is therefore possible that what he attributes to Indian sources may have been derived from depositions then obtained. But he discriminates between the traditions of the Peruvian Indians in general and those of the Inca in particular:

"However it may be, the Indians say that, with this their deluge, people were all drowned, and they relate that from the great lagoon of Titicaca there came out one Viracocha, who made his abode at Tiaguanaco, where today are seen ruins and parts of ancient and very strange edifices, and that from there they came to Cuzco, and so the human family began to multiply. They point out in that lagoon an islet where they fable that the Sun concealed and maintained itself, and for this reason they anciently made to it there many sacrifices, not only of sheep, but of men. Others say that out of a certain cave, through the window, there came six or I do not know how many men, and that these made the beginning of the propagation of mankind, and this was at what for

that reason they call Pacari Tambo. So they are of opinion that the Tambos are the oldest lineage of mankind. From there, they say, proceeded Mangocapa, whom they recognize as the founder and head of the Ingas. . . . What learned men assert and write is, that whatever there is of memories and relations of these Indians, goes back to four hundred years. . . ." (35)

Elsewhere Acosta states :

"The first man the Indians mention as the beginning of the Incas was Mangocapa, and of him they fable that, after the deluge, he came out of a cave or window of Tambo, which is five or six leagues from Cuzco." (36)

The Dominican Gregorio García, who spent a number of years in Peru, copies Betanzos almost literally. (37)

Among those authors from the sixteenth century who (aside from Oviedo, who has already been spoken of), while not having visited South America, deserve to be mentioned, Francisco Lopez de Gomára, Levinus Apollonius, and Antonio de Herrera are the most prominent.

Gomara was a contemporary of Betanzos, Cieza, and Zárate ; his *Crónica*, which appeared in print in 1552, was not received favorably by the Spanish government (38); indeed, his statements concerning Spanish America were severely impeached, but the incriminations address themselves mostly to what he wrote concerning events of the conquest. About the Inca, Gomára states :

"Their origin was from Tiquicaca, which is a lagoon in the Collao, forty leagues from Cuzco, the name of which signifies *Island of Lead*, for of many islets that are inhabited, one or the other contains lead, which is called *tiqui*. It is eighty leagues in circumference, and receives ten or twelve large rivers and many brooks. These are emptied through a single river, but large and deep, that terminates in another lagoon, forty leagues toward the east, where it loses itself, not without causing admiration to him who sees it. The principal Inca who took away from Tiquicaca the first ones and led them was named Zapalla, signifying *only chief*. Some aged Indians also say that he was called Viracocha, which is to say *grease of the sea*, and that he brought his people by sea. They finally affirm that Zapalla peopled and settled Cuzco, whence the Incas began to make war upon the surroundings. . . ." (39)

It is singular that Gomára, whose book appeared in print three

years before that of Zárate, makes the same statements regarding Titicaca as the latter; and it is also strange that this version about Zapalla (and the name itself) is not repeated by any other writer, Levinus Apollonius excepted. The latter may have copied Zárate (40), but Gomára not, unless he had access to his manuscripts, of which he makes no mention. It seems impossible that Gomára obtained the tale of the "Inca Zapalla" from Betanzos. It might be that the name is a corruption of Zapana, a chief of the Collao, of whom Cieza de León speaks; but this is rendered doubtful by the fact that Cieza's first part of the *Crónica* appeared in the same year as Gomára's work.

Herrera (41), who was royal chronicler for the Indies and a critic of rare sagacity for his time, finished his History at the close of the sixteenth century. As far as possible he avoided relying on isolated statements, however interesting they might appear, and thus omitted more than one which, after his time, turned out to be true. (42) In regard to Titicaca and the traditions concerning it, he has evidently relied on the writings of Cieza, at least in part; but he must have had at his command other confirmatory documents.

Herrera affirms that the Cuzco Indians claimed that the first men emerged from Lake Titicaca. He states:

"They also say that in the islands of Titicaca, in the Collao, were men with beards, and white; and that a captain coming from the valley of Coquimbo, and called Cara, came to Chuquito and passed to the island and killed the bearded people. . . . The Indians also say, from what they have by tradition from their forefathers, and from the songs, it appears, that in the days of antiquity they were a long time without seeing the sun, and that in consequence of great vows and rogations to their Gods, the Sun came out of the Lagoon of Titicaca and the island which is in it, that is in the Collao, and that, forthwith, from the part of mid-day, appeared a white man. . . ." (43)

The influence of Cieza is plain. Of Manco Capac he says that he first appeared at Pacaritambo. (44)

To the same class of writers as Gomára, Apollonius, and Herrera, belongs Fray Hierónimo Roman. In his *Repúblicas del Mundo*, 1595, he evidently follows Betanzos and Cieza (45), laying

much stress on ancient Indian songs as the most reliable source of authentic tradition.

In the seventeenth century, aside from investigations carried on officially through the agency of such Jesuits as Father Pablo Josef Arriaga (46), Father Terhuel (47), Francisco Dávila (48), and of Archbishop Villagomez (49), which more directly concerned the coast tribes and those of the Peruvian highlands outside of Cuzco, we meet with the works of three Augustine monks, two Jesuits, and one Indian writer from the vicinity of Cuzco. There may be others, but I have no knowledge of them. As to the annalist Montesinos (50), and Rocha, the imitator of Gregorio García (51), they are not of much importance. Montesinos certainly gathered a number of Indian tales, but he unfortunately manipulated them in the promotion of a pet theory.

The Jesuit Anello Oliva is not the oldest, in point of date, of the authors mentioned; but I prefer to dispose of him first, since he acknowledges one of his main sources to have been fragments of the writings of Father Blas Valera, also used by Garcilasso de la Vega. In addition to Valera, Oliva consulted manuscripts of a certain Doctor of Theology, Bartolomé Cervantes, and an Indian from Cochabamba in central Bolivia whom he designates as a "descendant of the chroniclers of the Incas," proficient in the Quichua language and versed in ancient lore. Oliva attributes too much importance to the *quipus*, for we have seen from the statements of Garcilasso himself how slender is the hold they afford. If, not thirty years after the conquest, tradition (that alone enabled their interpretation as far as interpretation could go) was already dim, how much more diffuse must it have been a century later. Besides, Oliva's Indian informant, Catári, lived far away from Cuzco, and his name indicates that he was an Aymará (probably versed in the Quichua language, but still an Aymará) and not of Inca blood. His information, therefore, cannot have been original. Cochabamba was never overrun by the Cuzco tribe; its aborigines were Quichua-speaking Indians, but they were separated from the Inca by a wide zone of Aymará who had mostly remained absolutely independent. From these sources Oliva (52) has framed the following story:

“After the Deluge, the first people came to South America from parts unknown, landing somewhere on the coast of Venezuela. From there they gradually scattered over the whole continent, one band reaching the coast of Ecuador near Santa Elena. Several generations passed, many made voyages along the coast and some were shipwrecked. At last one branch took up its abode on an island called Guayau, near the shores of Ecuador. On that island Manco Capac was born, and after the death of his father Atau, he resolved to leave his native place for a more favored clime. So he set out, in such craft as he had, with two hundred of his people, dividing them into three bands. Two of these were never heard from again, but he and his followers landed near Ica, on the Peruvian coast, thence struggled up the mountains, reaching at last the shore of Lake Titicaca. There Manco separated from the others, leaving them with orders to divide after a certain time and to go in search of him, while he took the direction of Cuzco. He told his people, before leaving, that when any of the natives should ask them their purpose and destination, to reply that they were in quest of the son of the Sun. After this he departed, reaching at last a cave near the Cuzco valley, where he rested.

“When the time had elapsed, his companions started in several groups in search of him. One of these crossed over to the Island of Titicaca, where they were surprised to find a rock, and in this rock a cave lined with gold, silver, and precious stones. Thereupon they sunk the craft in which they had reached the island, and agreed among themselves, if anybody from the surrounding country should appear, to say that they had come out of the cave to look for the son of the Sun.

“A few days after, on the day of the full moon, they saw some canoes approaching, and they forthwith retreated to the cavern. Those who came in the canoes, when they approached the cliff and perceived the strangers viewing the cave apparently with the greatest unconcern, were surprised. The strangers gave them to understand that they had just come out of the rock and were in quest of the son of the Sun. This filled the others with profound respect for the newcomers; they worshipped them and made offerings to the rock, sacrificing children, llamas, and ducks. All together went back to the mainland, and shortly afterward learned that at Pacari Tampu the son of the Sun had come out of a cavern, called Capactocco, in great splendor, bedecked with gold, as brilliant in appearance as his father, and that with a sling he had hurled a stone with such force that the noise was heard for more than a league off, and the stone made in the rock a hole as large as a doorway.

“At this news all the people of those regions went to see the miracu-

lous being. Manco Capac received them as subjects. On this artifice he began to base his authority and the subsequent sway of the Inca tribe.” (53)

Oliva mentions a tradition concerning Tiahuanaco according to which that place would be the oldest settlement in the land. He says that the original name for Tiahuanaco is Chucara and that nothing is known of its earliest history beyond that “there lived the great chief Huyustus, who, they say, was lord of the world.” This was long previous to the time of Manco Capac. (54)

A certain degree of authentic tradition is discernible in Oliva's statements, but it is plain that these traditions were not obtained at first hand and that they had already been tinged by time and distance from the theater of events ; moreover, Oliva arranged them to suit himself. A remote connection between Titicaca and its rock, and the first establishment of the Inca at Cuzco are indicated, but this does not signify an insular origin of the Inca. That origin is placed on an island, but on the coast of Ecuador, with hints at extra-American descent. This connection with the question of the first peopling of America makes it evident that Oliva stated the case in a subjective rather than in an objective manner like Betanzos, Cieza, and the Indian informants from Pacaritambo in 1542.

Father Bernabé Cobo, a contemporary of Oliva and also a Jesuit, is more objective than the latter. He begins with Tiahuanaco, affirming that its real name was Taypi Kala (signifying in Aymará *middle* or *central stone*), and that from Tiahuanaco departed those who, after the deluge, repopled the earth. Of Titicaca he states, in agreement with Cieza :

“The adulatory of the Sun on the Island of Titicaca was a large and solid cliff, the worship of which (and the reason why they consecrated it to the sun) has its origin in a ridiculous tale which is : The ancient affirm that having been without light from heaven for many days in that province, and all the inhabitants being in admiration, confusion, and awe, about this protracted obscurity and darkness, those who dwelt on the aforesaid Island of Titicaca saw one morning the sun come out of that rock with great splendor, from which they gathered that the rock was the house and home of the Sun, or the one thing which it most esteemed in the world ; and so they dedicated it to the Sun and erected there a

sumptuous temple, for those times, although not so splendid as it became after the Incas enlarged and embellished it.

“Others relate this fable differently and say: The reason why this rock had been dedicated to the sun was because the sun was concealed under it and preserved during all the time covered by the deluge. When it was over, the sun came forth from it and began to illuminate the world in those parts, that rock being the first object which enjoyed its light. Whatever may have been the beginning and origin of this shrine, it was of great antiquity, and was always much revered by the people of the Collao before they were subjugated by the Incas.” (55)

He then goes on to state that the report of the existence of the shrine came to the ears of Tupac Yupanqui, who determined to visit it. “He went to the Island of Titicaca and found the altar and temple dedicated to its gods,” so he resolved to enhance its appearance. It is seen that Cobo attached some importance to the existence of the shrine at a period long prior to the Inca. What he says might be construed to mean that the existence of the shrine was unknown at Cuzco until then. (56) When Cobo and Oliva were in Peru, the Jesuits had under their spiritual care that part of the lake shore northwest of Copacavana, also inhabited by Aymará. They were, on that side, the nearest neighbors of the Augustines, who therefore had quite as fair an opportunity of becoming intimate with the Indians as had the Jesuits. On the other hand, the Augustines, having in charge the territory formerly occupied by the Inca, both on lake and mainland, held under their control the Aymará of those parts as well as the small Inca colony. To a certain extent they were more favorably situated than the Jesuits, but the Indian seldom, if ever, reveals to his confessor the things of the past, for they belong to his ancient creed and have nothing to do with the practices of another. Furthermore, at that time stringent measures were taken to eliminate aboriginal rites from the natives of Peru. It is true that the Jesuits were specially charged with this task, which made the Indians more suspicious of them; but where, as in the case of Copacavana and the island, they could not exercise jurisdiction, they were more lenient, hence the natives could talk more freely to them than to their official confessors at Copacavana. It is therefore possible that Cobo (who personally was a gifted investigator) obtained data even from people who knew ancient

lore which they would not divulge to the Augustines to whose parish they pertained. (57)

The Augustine monk Fray Alonso Ramos appears as a cornerstone of the information preserved by writers of his order from the seventeenth century. (58) Were it the object of this investigation to trace the origin of the Inca, the version given of it by Ramos would find its place here. It is a highly interesting confirmation of the story told by the two shamans from Pacaritambo in 1542, but in it not a word is said of Titicaca. Manco Capac is represented as the child of a medicine-man from Pacaritambo. (59) In another chapter his editor, Father Rafael Sans, mentions a popular belief in the descent of Manco Capac from Titicaca, tracing the visit of Tupac Yupanqui to the island to a notice given him of its shrine by an attendant thereof who went to Cuzco for the purpose. (60) Ramos also speaks of a mysterious white man, called Tunupa and Taapac, murdered by the Indians on Titicaca island, who impaled him on a stake of *chonta*-wood (*Bactris ciliata*). The shrine was in existence even at the very remote period at which this is said to have occurred. (61) Mention is made of the belief that, after several days of obscurity, the Sun came out from the sacred rock, and this is given as the cause of the cult afterward addressed to that cliff. (62) It is observed that Ramos agrees with Cobo in regard to the manner in which Titicaca was brought to the notice of Tupac Yupanqui. They were not only contemporaries, but neighbors for several years, hence it is not possible to determine whether their information was independently obtained, whether one copied the other, or whether the statement is an interpretation.

The Augustine Fray Antonio de la Calancha was also an inmate of the Copacavana convent and a contemporary of Ramos, whom he copies extensively. (63) In addition, he quotes the Licentiate Polo de Ondegardo, former *corregidor* of the city of Cuzco under the viceroy Toledo, and a zealous student of Indian antiquities. According to Calancha the investigations of Ondegardo were carried on "in all the country above Chuquiago [La Paz], Chuquisaca [Sucre], Potosi, and their surroundings, where the Licentiate Polo made his inquiries, and in that of Chucuito." (64) Under the supposition that he limited himself to those points, his Aymará traditions

would have come from northern Bolivia and southeastern Peru, and those of the Quichua from central Bolivia. But it is more than likely, in view of his position at Cuzco when Toledo made the official inquiries after 1570, that he also embodied lore from the Inca and their immediate neighbors. Calancha says that, according to what Ondegardo gathered, the first men lived in obscurity and were nearly all destroyed by a flood, but they multiplied again and the builders of Tiahuanaco were turned into stone; after which, at Tiahuanaco and on Lake Titicaca, the sun and moon appeared. "The sun at once went to the Indian Mango Capac, adopted him, made him king, . . . and then rose into the heavens." As his own opinion Calancha states that "the Indian Manco Capac, first king of Peru, was a native of Tiahuanaco, or of some village near it." (65)

There are several other Augustine writers of that period, among them Father Hippolyto Maracci (66); but their information may be regarded as condensed in the book of Fray Andrés de San Nicolás, for many years an inmate of Copacavana convent. (67) He is based largely on Ramos and Calancha, and admits that "the foundation which the Indians had in worshiping the island and the rock . . . was because on it the family of the Incas had their fabulous origin." (68) He then suggests an explanation of these fables, copying Ramos, but with the difference that he looks upon Manco Capac as the son of a chief of the lake region, hence as an Aymará, not a Quichua Indian. The farther we recede from the epoch of first contact of Europeans with the natives, the more and more does the objective rendering of traditions give way to opinions and explanations.

In the writings of the Quichua Indian Juan de Pachacuti Yamqui Salcamayhua, from the middle of the seventeenth century, we might expect to find untainted lore. (69) He tells us that the peopling of that part of South America took place from the southeast, from "above Potosi." After the country was settled, there came to the Collao a bearded man whom he calls Tonapa, also Viracocha Pachayachachican, who performed miracles and whom Salcamayhua therefore identifies with Saint Thomas the apostle. He describes the wanderings of this personage and his tribulations among the barbarous natives around Lake Titicaca, and concludes by stating

that "they say that the said Tonapa, after having liberated himself from the hands of those barbarians, remained some time on a rock called Titicaca," and that afterward he passed through Tiquina toward Chacamarca, and on his way came to a village called Tiahuanaco, where the people ridiculed his teachings. In punishment he changed them into stones. From Chacamarca he followed the Desaguadero to the south, finally reaching the ocean, where he disappeared. While in the Collao, Tonapa met a chief called Apotampo, who was the only one who gave ear to his teachings, in consideration of which Tonapa gave him "a piece of wood from his walking-stick." (70) This Apotampo was father to Manco Capac, to whom Salcamayhua also attributes the foundation of Cuzco, which place was then already occupied by Indians, so that by "foundation" the establishment of a regular settlement must be understood.

The analogy of these tales with those reported by Betanzos and Cieza is apparent, and the story of the "walking-stick," of which Tonapa gave a piece to Apotampo, recalls the magic wand spoken of by Garcilasso de la Vega. The traditions recorded by Salcamayhua are, therefore, probably authentic, minus such changes and additions which a century of intercourse with Europeans may have introduced. These changes occur with versions circulating outside of intimate circles of medicine-men and also with those preserved by shamans not especially entrusted with the keeping of ancient lore. The keepers of the faith are quite inaccessible to inquiry, and how much their knowledge may differ from current talk we have seen in the instance of the wizards from Pacaritambo in 1542. It does not appear that Salcamayhua belonged to the "knowing ones," who were closely watched at that time and even persecuted, for they were and still are those who, as it is said among the Aymará and the lower classes of the people in Bolivia, "know it all."

The testimony of the traditions which we have repeated here is to the effect that at a very remote period there existed some relation between the Island of Titicaca and natural phenomena of such importance as to leave a lasting impression on the memory of the aborigines; but the nature of these phenomena can only be conjectured. (71) In connection with extraordinary occurrences in nature it is sometimes mentioned that the Inca had their origin on Titicaca

island. It is not impossible that at a very remote period some intercourse may have existed between the island and the Cuzco valley. Folktales concerning that region of South America seem to indicate that tribal shiftings were in the main directed to the northward. These shiftings took place irregularly and covered a long period of time. (72) In the course of such changes Titicaca island, for some reason not yet ascertained, has secured a foothold in the myths and traditions of the people.

NOTES

1. The "Viracochas" here mentioned recall the "white and bearded men" of Cieza de León. See farther on.

2. Compare my article on "The Montezuma of the Pueblo Indians," *American Anthropologist*, October, 1892, p. 325; also Archæological Institute of America, *Final Report*, vols. I and II.

3. Especially at the pueblo of Cochiti, New Mexico, where my deceased host, Juan José Montoya, was very fond of displaying a smattering of classical history, gathered at random in conversation with the priests. It would carry me entirely too far to refer in detail to the innumerable sermons, printed in the Quichua language, in which references to Greek and Roman history are made.

4. At Copacavana intercourse between the clergy and the aborigines was intimate in the sixteenth century, and many Indians could read and write. Perhaps one of the oldest documents of that kind from Peru is the statement, in writing, made by Francisco Tito Yupanqui, the Indian from Copacavana who carved the image of the Virgin now venerated at the Sanctuary. This document is from the latter part of the sixteenth century and undoubtedly genuine. See Ramos, *Historia*, p. 132 et seq.

5. *Historia general y natural* (vol. IV, lib. XLVI, p. 225): "Á esta tierra vino antiguamente un grand señor con una gente que llaman Inga é agora se llaman orejones, é solo al superior le llaman Inga. . . . Este señor que llaman Inga pobló el Cuzco, é hiço una cibdad muy fuerte para residir él." . . . He is also the first to give the name or title of Capac Inca, applying it to the head war-chief. (Idem.)

6. Most of the original manuscripts of Betanzos from that time are in the national archives at Lima, Peru. Among them is also the *Doctrina Cristiana* in Quichua, showing that he was thoroughly versed in that idiom.

7. *Suma y Narracion de los Incas* (cap. I): "En los tiempos antiguos, dicen ser la tierra é provincia del Peru escura, y que en ella no habia lumbre ni dia. Que habia en este tiempo cierta gente en ella la cual gente tenia cierto señor que la mandaba y á quien ella era subjeta. Del nombre desta gente ó del señor que la mandaba no se acuerdan. Y en estos tiempos que esta tierra era toda noche, dicen que salió de una

laguna que es en esta tierra del Peru en la provincia que dicen de Collasuyo, un señor que llamaron Con Tici Viracocha, el cual dicen haber sacado consigo cierto número de gentes, del cual número no se acuerdan. Y como hubiese éste salido desta laguna, fuese de allí á un sitio que está junto á esta laguna que está donde hoy día es un pueblo que llaman Tiaguanaco, en esta provincia ya dicha del Collao; y como allí fuese él y los suyos, luego allí en improviso dicen que hizo el sol y el día, y que al sol mandó que anduviese por el curso que anda; y luego dicen que hizo las estrellas y la luna. El cual Con Tici Viracocha dicen haber salido otra vez antes de aquella, y que en esta primera vez que salió, hizo el cielo y la tierra, y que todo lo dejó oscuro; y que entonces hizo aquella gente que había en el tiempo de la escuridad ya dicha; que esta gente le hizo cierto deservicio á este Viracocha, y como dello estuviese enojado, tornó esta vez postrera y salió como antes había hecho, y á aquella gente primera y á su señor, en castigo del enojo que le hicieron, hizolos que se tornasen piedra luego.

“Así como salió y en aquella misma hora, como ya hemos dicho, dicen que hizo el sol y día, y luna y estrellas; y que esto hecho, que en aquel asiento de Tiaguanaco, hizo de piedra cierta gente y manera de dechado de la gente que despues había de producir haciendolo en esta manera: Que hizo de piedra cierto número de gente y un principal que la gobernaba y señoreaba y muchas mujeres preñadas y otras paridas y que los niños tenían en cunas, segun su uso; todo lo cual así hecho de piedra que lo apartaba á cierta parte; y que él luego hizo otra provincia allí en Tiaguanaco, formándolos de piedras en la manera ya dicha, y como los hoviese acabado de hacer mandó á toda su gente que se partiesen todos los que él allí consigo tenía, dejando solos dos en su compañía, á los cuales dijo que mirasen aquellos bultos y los nombres que les había dado á cada género de aquellos, señalándoles y diciéndoles; estos se llamarán los tales y saldrán de tal fuente en tal provincia, y poblarán en ella, y allí serán aumentados; y estos saldrán de tal cueva, y se nombrarán los fulanos, y poblarán en tal parte, y así como yo aquí los tengo pintados y hechos de piedras, y así han de salir de las fuentes y rios, y cuevas y cerros, en las provincias que así os he dicho y nombrado; é ireis luego todos vosotros por esta parte (señalándoles hacia donde el sol sale), dividiéndoles á cada uno por sí y señalándoles el derecho que debía de llevar.” The *Huaca* or *Achachila* cult is not infrequently stated to have originated in this creation myth. Sources that do not mention the legend of Viracocha still relate the Indian belief in descent of man from springs, rivers, rocks, and other natural objects.

Idem (cap. 11): “É así se partieron estos viracochas que habeis oído, los cuales iban por las provincias que les había dicho Viracocha, llamando en cada provincia, así como llegaban cada uno de ellos, por la parte que iban á la tal provincia, los que el Viracocha en Tiaguanaco les señaló de piedra que en la tal provincia habían de salir; poniendose cada uno destos viracochas allí junto al sitio dó les era dicho que la tal gente de allí había de salir; y siendo así, allí este Viracocha decía en alta voz: ‘Fulano, salid é poblad esta tierra que está desierta, porque así lo mandó

el Con Tici Viracocha, que hizo el mundo !' — Y como estos así los llamasen, luego salían las tales gentes de aquellas partes y lugares que así les era dicho por el Viracocha. Y así dicen que iban estos llamando y sacando las gentes de las cuevas, ríos y fuentes é altas sierras, como ya en el capítulo antes deste habeis oído, y poblando la tierra hacia la parte dó el sol sale." I forego quoting the complete text of chapters II, III, and IV.

8. *Suma y Narracion* (cap. IV, p. 14) : "Y volviéndose estos indios que esto hicieron así á su pueblo, Manco Capac y su compañero Ayar Auca salieron de sus rancherías, llevando consigo sus cuatro mujeres ya nombradas, y caminaron para el pueblo de el Cuzco, donde estaba Alcaviza. Y antes que llegasen al pueblo, dos tiros de arcabuz, estaba poblado un pueblo pequeño, en el cual pueblo había coca y ají ; y la mujer de Ayar Ocho, él que se perdió en la cueva, llamada Mama Guaco, dió á un indio de los deste pueblo de coca un golpe con unos Ayillos y matóle y abrióle de pronto y sacóle los bofes y el corazón, y á vista de los demás del pueblo, hinchó los bofes soplándolos ; y visto por los indios del pueblo aquel caso, tuvieron gran temor, é con el miedo que habían tomado, luego en aquella hora se fueron huyendo al valle que llaman el día de hoy Gualla, de donde han procedido los indios que el día de hoy benefician la coca de Gualla. Y esto hecho, pasaron adelante Manco Capac y su gente, y hablaron con Alcaviza, diciéndole que el sol los enviaba á que poblasen con él allí en aquel pueblo del Cozco ; y el Alcaviza, como le viese tan bien aderezado á él y su compañía, y las alabardes de oro que en las manos traían, y el demás servicio de oro, entendió que era así y que eran hijos del sol, y dijoles que poblasen donde mejor les pareciese. Y el Manco Capac agradecióselo, y pareciéndole bien el sitio y asiento dó ahora es en esta ciudad del Cuzco la casa y convento de Santo Domingo, que antes solía ser la casa del Sol . . . hizo allí el Manco Capac y su compañero, y con el ayuda de las cuatro mujeres, una casa, sin consentir que gente Alcaviza les ayudase, aunque les querían ayudar ; en la cual se metieron ellos dos y sus cuatro mujeres."

There is a confirmation of this tradition (of the manner in which Manco Capac established himself and his people at Cuzco) in an official document of January 26, 1572, forming part of the *Informaciones acerca del Señorío y Gobierno de los Incas ; Hechas por Mandado de Don Francisco de Toledo* (p. 230). Four Indians from Cuzco and from the *ayllu* or clan "Ayaruchu," stated that theirs was one of the three original clans inhabiting the Cuzco valley previous to the Inca, that they were afterward called "Alcauizas" by the Inca, and that Manco Capac "entró con mañas donde los dichos tres Ayllus estaban y tenían sus asientos halagándolos con palabras, y con gente que iba trayendo de otras partes y metiéndola de noche, se les iba entrando por fuerza en las tierras que tenían, y en diciéndole los dichos indios que no se les entrase en sus tierras, les respondía que callasen, que todos eran hermanos. . ." I quote this only to show that the general character of the tales reported by Betanzos bears the stamp of authenticity and genuineness, so far as their Indian origin is concerned. To the *Informaciones* I shall refer later.

9. *Primera Parte de la Crónica del Perú* (cap. ciii, p. 445).

10. *Idem* (p. 443): "Y que el uno dellos entró en la laguna de Titicaca y que halló en la isla mayor que tiene aquel palude gentes blancas y que tenían barbas, con los cuales peleó de tal manera, que los pudo matar á todos." This tale recalls the "gentlemen" (*caballeros*) living on the island, before the time of the Inca, about whom we were told while on the island.

11. The series of Inca war-chiefs as given by the various authors do not always agree, but I cannot enter into a discussion of this here. We are fortunate if we can even approximate the century in which an event has taken place. Only with the war-chief Tupac Yupanqui begins a certain agreement among the various sources.

12. *Segunda Parte de la Crónica* (cap. v, p. 5): "Antes que los Incas reinasen en estos reinos ni en ellos fuesen conocidos, cuentan estos indios otra cosa muy mayor que todas las que ellos dicen, porque afirman questuviéron mucho tiempo sin ver el sol, y que padeciendo gran trabajo con esta falta, hacian grandes votos é plegarias á los que ellos tenían por dioses, pidiéndoles la lumbre de que carecian: y questando desta suerte, salió de la isla de Titicaca, questá dentro de la gran laguna del Collao el sol muy resplandeciente, con qué todos se alegraron. Y luego questo pasó, dicen que de hacia las partes del Mediodia vino y remanesció un hombre blanco de crecido cuerpo, el cual en su aspecto y persona mostraba gran autoridad y veneracion, y queste varon, que así vieron, tenía tan gran poder que de los cerros hacía llanuras y de las llanuras hacía cerros grandes, haciendo fuentes en piedras vivas: y como tal poder reconociesen llamabanle Hacedor de todas las cosas criadas, Principio dellas, Padre del sol, porque, sin esto, dicen que hacía otras cosas mayores porque dió ser á los hombres y animales, y que, en fin, por su mano les vino notable beneficio. . . . Generalmente le nombran en la mayor parte Ticiviracocha, aunque en la provincia del Collao le llaman Tuapaca y en otros lugares Arnauan."

13. *Segunda Parte* (cap. iv, p. 4): "Tambien cuentan lo que yo tengo escripto en la primera parte, que en la isla de Titicaca, en los siglos pasados hobo unas gentes barbadas, blancas como nosotros, y que saliendo del valle de Coquimbo un capitan que habia por nombre Cari, allegó á donde agora es Chucuito de donde despues de haber hecho algunas poblaciones, pasó con su gente á la isla y dió tal guerra á esta gente que digo, que los mató á todos. Chirihuana, gobernador de aquellos pueblos, que son del Emperador, me contó lo que tengo escripto." . . . The Indian word *Chirihuana* is given by Cieza as the name of a "governor" of Indians under Spanish rule and by Spanish appointment. Among the Aymará there is a cluster of dancers called "Chirihuano." It is likely that "Chirihuana" is derived from *Chiri-Huayna* meaning "dark youth," which would confirm the suggested etymology of the name of the dancers, of which I have treated in a previous chapter. It is well to remember also that titles and surnames of Indians were and are often understood as personal names. The chief alluded to may have been a

Chirihuanos; if so, this would confirm the statement of our informant on Titicaca island to the effect that the Chirihuanos are one of the most ancient, now esoteric, groups among the Aymará, and at the same time would give greater importance to the tradition, as folklore preserved by a particular cluster of shamans.

14. *Primera Parte de la Crónica*, (cap. c, p. 443): "Antes que los Ingas reinasen, cuentan muchos indios destos collas que hubo en su provincia dos grandes señores, el uno tenia por nombre Zapana, el otro Cari, y que estos conquistaron muchos pucares, que son sus fortalezas: y que el uno dellos entró en la laguna de Titicaca, y que halló en la isla mayor que tiene aquel palude gentes blancas y que tenían barbas, con los quales peleó de tal manera, que los pudo matar á todos . . . y al fin de haber hecho notables cosas estos dos tiranos ó señores que se habian levantado en el Collao, volvieron las armas contra sí dándose guerra el uno al otro procurando el amistad y favor de Viracocha inga, que en aquellos tiempos reinaba en el Cuzco, el cual trató la paz en Chucuito con Cari, y tuvo tales mañas, que sin guerra se hizo señor de muchas gentes destos collas."

15. For details of the biography of Cieza, I refer to the Introduction of the *Segunda Parte de la Crónica* by Jimenez de la Espada, and to vol. II of Vedia's *Historiadores primitivos de Indias* (Noticias biográficas, pp. ix, x).

16. *Discurso sobre la Descendencia y Gobierno de los Ingas*, published in 1892 by Jimenez de la Espada under the title *Una Antigualla Peruana*. I owe the knowledge of this highly interesting document to the notice which my esteemed friend Carlos A. Romero, custodian of the National Archives at Lima, gave me of its existence at the library, accompanying the information with the book itself. The text of what I have translated is: "Al tiempo que gobernó en este reino del Perú el licenciado Vaca de Castro, pretendiendo con mucha solicitud saber la antigualla de los indios deste reino y origen dellos, de los ingas, señores que fueron destos reinos, y si fueron naturales desta, tierra ó advenedizos de otras partes . . . hizo juntar y parecer ante sí á todos los ingas viejos é antiguos del Cuzco y de toda su comarca, é informarse dellos, como se pretendió, ninguno informó con satisfaccion sino muy variablemente cada uno en derecho de su parte, sin saber dar otra razon mas que todos los ingas fueron descendientes de Mango Capac, que fué el primer inga, sin saber dar otra razon, no conformando los unos con los otros. E vistóse apuradas en esta demanda, dixeron que todos los ingas pasados tuviéron sus *Quipu-Camayos*, ansi del origen y principio dellos, como de los tiempos y cosas acontecidas en tiempo de cada señor dellos: é dieron razon, que con la venida de *Challcochima é Quisquis*, capitanes queran por *Atao-vallpa Inga* que destruyeron la tierra, los cuales mataron todos las *Quipo-camayos* que pudieron haber á las manos y los quemaron los quipos, diciendo que de nuevo habian de comenzar de *Ticcicapac Inga*, que ansi le llamaron á *Atao Vallpa Inga*, é dieron noticia de algunos que quedaron, los cuales andaban por los montes atemorizados por los tirános pasados.

Vaca de Castro envió luego por ellos y le trujeron antél cuatro muy viejos.

“Estos Quipocamayos habian sido á manera de historiadores contadores de la razon, y fueron muchos, y en todos ellos habia conformidad en sus quipos y cuentas: no tenian otro ejercicio mas de tener gran cuenta con sus Quipos ansi del origen, principio de los ingas, come de cada uno en particular, desde el día que nacia cada uno como de las cosas acontecidas en tiempo de cada señor dellos. Estaban obligados á dar cuenta y razon de todo lo que les demandasen, y estaban obligados á enseñar á sus hijos y tenerlos bien examinados y verdaderos, dándoles á conocer las significaciones de cada cosa. A estos se les daba racion muy cumplida de todo género de mantenimientos para cada mes del año, y se les daban mujeres y criados, y ellos no habian de tener otra ocupacion mas de tener gran cuenta con sus quipos, y tenerlos bien alistados con la relacion verdadera. Los que trujeron ante Vaca de Castro pidieron término para alistar sus quipos, y se les dieron y en partes cadauno de por sí apartados los unos de los otros, por ver si conformaban los unos con los otros en las cuentas que cada uno daba. Diéron este cargo á personas de mucha curiosidad por interpretacion de Pedro Escalante indio ladino en lengua castellana, el cual servia á Vaca de Castro de intérprete, con asistencia de Juan de Betanzos y Francisco de Villacastin vecinos desta ciudad del Cuzco, personas que sabian muy bien la lengua general deste reino, los cuales iban escribiendo lo que por los Quipos iban declarando.” It would be too prolix to quote the full text of the Indian’s talk (p. 5).

17. *Discurso* (p. 9): “Los dos Quipocamayos de los cuatro que ante Vaca de Castro parecieron, el uno llamado Callapiña y el otro Supno [perhaps *Sucso*, which is a Quichua name], los cuales fuéron naturales de Pacaritambo, estos dieron razon que sus padres y abuelos, como Quipocamayos que fueron de los ingas, contaban á sus hijos y nietos, encomendando el silencio dello, haber sido Mango Capac, primer inga hijo de un Curaca, Señor de Pacaritambo, que no le alcanzaron el nombre porque como naturales del mismo lugar, alcanzaron el origen del.” (p. 9.)

18. Special attention is called to the phrase “encomendando el silencio dello.” It shows that the *true* story, divested of mythologic embellishment, was known and preserved, but as a *secret* not fit to be told the “vulgar.” This hints at esoterism existent long prior to the pressure exerted upon the shamans after the conquest. I also call attention to the words “sino muy variablemente cada uno en derecho de su parte.” This means that the Inca Indians first questioned, replied each one to suit his own interest, and different from the others.

19. *Historia del Descubrimiento y Conquista de la Provincia del Perú* (reprint in vol. II of *Historiadores primitivos*, of Vedia, cap. x, p. 470): “En todas las provincias del Perú habia señores principales, que llamaban curacas. . . . Estos señores mantenian en paz sus indios . . . sin tener señor general de toda la tierra, hasta que de la parte del Collao por una gran laguna que allí hay, llamada Titicaca, que tiene ochenta leguas de

boja, vino una gente muy belicosa, que llamaron ingas: los cuales andan tresquilados y las orejas horadadas, y metidos en los agujeros unos pedazos de oro redondo con qué les van ensanchando. Estos tales se llaman ringrim, que quiere decir oreja. Y al principal dellos llamaron Zapalla inga, que es solo señor, aunque algunos quieren decir que le llamaron inga Viracocha, que es tanto como espuma ó grasa de la mar; porque, como no sabian el origen de la tierra donde vino, creian que se habia criado de aquella laguna. . . . Estos ingas comenzaron á poblar la ciudad del Cuzco."

20. *Relacion* (p. 234): "Unos dicen que salió de la isla de Titicaca ques una isla questá en una laguna en el Collao, que tenia sesenta leguas en torno. . . . Otros indios dicen que este primer Señor salió de Tambo; este Tambo está en Condesuios seis leguas del Cuzco poco mas ó menos. Este primer Inga dicen se llamaba Inga Vira Cocha" . . .

21. *Segunda Parte de la Crónica* (p. 3): "Porque yo lo que voy contando no tengo otros testimonios ni libros que los dichos de estos indios." (p. 14:) "Y parece que los pasados Incas, por engrandecer con gran hazaña su nacimiento, en sus cantares se apregona lo que en esto tienen." (cap. XI, p. 35:) "Y así, sabido lo que se ha de decir de lo pasado en semejantes fiestas de los señores muertos, y si se trata de guerra por el consiguiente, con orden galano cantaban de muchas batallas que en lugares de una y otra parte del reyno se dieron; y por el consiguiente, para cada negocio tenian ordenados sus cantares ó romances, que, viniendo á propósito, se cantasen para que por ellos se animase la gente con lo oir y entendiesen lo pasado en otros tiempos, sin lo inorar, por entero. Y estos indios que por mandado de los reyes sabian estos romances, eran honrados por ellos y favorecidos, y tenian cuidado grande de los enseñar á sus hijos y á hombres de sus provincias los mas avisados y entendidos que entre todos se hallaban; y así, por las bocas de unos lo sabian otros, de tal manera, que hoy dia entre ellos cuentan lo que pasó ha quinientos años, como si fueran diez." He calls the *quipucamayos* simply "*contadores*," and limits their duties to recording tribute in every district or tribe, "y por estos nudos tenian la cuenta y razon de lo que habian de tributar los questaban en aquel distrito." I use the term "district," wishing however to have it understood as equivalent to "tribal range."

22. *The Fables and Rites of the Incas*. (In *Narratives of the Rites and Laws of the Incas*, published by the Hakluyt Society, 1873, after translations by Sir Clements R. Markham, pp. 4 to 8.) The full title of the manuscript in the National Archives of Lima is: *Relacion de las fabulas y ritos de los Yngas hecha por Christoval de Molina*, etc. The hospital for Indians was founded at Cuzco with the aid of voluntary donations of the Spanish inhabitants (to the amount of 17,314 pesos—a large sum for that time). The subscriptions were opened March 15, 1556, and in eleven days 14,500 pesos had been subscribed. See *Relacion de las mandas y limosnas que los vezinos y abitantes hizieron en la fundacion del dicho hospital*, MS., original in *Libro viejo de la fundacion de la gran ciudad del Cuzco*.

23. For Garcilasso's writings I used, while in Peru, the original edition of his *Comentarios Reales*. My library not having arrived at the date I rewrite this paper at New York, I have used translations; thus I shall refer also to Baudoin's French translation occasionally. The passages quoted are found in the original of the *Comentarios Reales* (vol. I, p. 14 et seq., and caps. xv to xvii inclusive).

24. *Comentarios* (vol. I, p. 14), also *Histoire des Yncas Rois du Pérou* (1704, vol. I, livre I, cap. xviii, p. 73 et seq.).

25. *Histoire des Yncas*, vol. I, livre I, cap. vi, p. 21, et seq.

26. *Idem*, vol. II, p. 33, et seq.

27. *Idem*, p. 489.

28. *Idem*, vol. I, p. 157.

29. *Informaciones acerca del Señorío y Gobierno de los Incas*.

30. *Idem* (p. 256): "Se les leyó á los dichos indios todo lo que estaba escripto y pintado en los dichos cuatro paños, así de los bultos de los Ingas, como de las medallas de sus mujeres é ayillos, é la historia de las cenefas de lo que sucedió en tiempo de cada uno de los Ingas, y la fábula y notables que van puestos en el primer paño, aquellos dicen de Tambotoco, y las fábulas de las creaciones del Viracocha que van en la cenefa del primer paño por fundamento y principio de la Historia." . . .

31. *Idem* (p. 267): "Otro testigo es don Diego Lucana, principal de los mitimas Cañaris y Chachapoyas Llaguas, que están en el repartimiento de los Lurinhuanas, en la Purificación de Huacho, . . . confirma todo lo anteriormente dicho, y añade que Manco Capac habia salido de una Peña de Plomo." This Lucana must have been either from southern Ecuador or from northeastern Peru, hence was not conversant with ancient lore at first hand. In regard to the derivation of *Titicaca*, it is certain that, in Quichua, *titi* means "lead" or "tin," and *kaka* means "rock"; the latter word has also the same signification in Aymará. But *Titicaca* is an Aymará, not a Quichua, word. The Indians who dwelt on and near the island, long before the Inca appeared there, were Aymará, who gave the name to the island in their language, in which it signifies "rock of the wild cat" or "cat-rock." For the Quichua etymology see Torres Rubio, *Arte y Vocabulario* (fol. 76, 162).

32. *Histoire du Pérou* (French translation of the *Miscelánea austral*, by Ternaux-Compans). His opinion on the traditions is on page 11: "Je pense donc qu'une famille qui habitait le haut Pérou conçut, vers cette époque, le projet de fonder une monarchie. Après avoir fabriqué secrètement des vêtements brillants d'or et de Pierrieres, ils quittèrent le lieu de leur habitation, et ne voyagèrent que de nuit, pour éviter d'être vus, ils arrivèrent á cinq lieues de Cuzco, dans un endroit où les habitants du voisinage avaient l'habitude de se réunir pour y tenir une espèce de marché et y échanger les produits de leur industrie — ils apparurent tout á coup au milieu d'eux et profitèrent de leur étonnement pour leur persuader qu'ils étaient enfants du soleil, et envoyés par lui. "This same explanation is offered later, by Anello Oliva. I shall refer to it hereafter.

The mention of Titicaca is found on page 144: "Beaucoup d'Indiens prétendent que les frères qui apparurent à Pacari-tambo, comme je l'ai raconté dans le premier chapitre, étaient nâtifs de Titicaca, et que ce fut dans cet endroit que l'on fabriqua les vêtements avec lesquels ils se montrèrent la première fois."

33. Torres Saldamando, *Los Antiguos Jesuitas del Perú* (pp. 2-10).

34. I use the copy of the *Historia natural y moral de las Indias* of 1608, published at Madrid (libro vi, cap. 19, p. 429): "Por Mandado de la Magestad Católica del Rey don Felipe nuestro señor, se hizo aueriguacion con la diligencia que fué posible del origen, y ritos, y fueros de los Ingas, y por no tener aquellos Indios escrituras, no se pudo apurar tanto como se desseára." This is clearly an allusion to the investigations conducted by the viceroy Toledo and reported on in the *Informaciones acerca del Señorío y Gobierno*, quoted above.

35. *Historia natural y moral* (lib. 1, cap. 25, pp. 82, 83).

36. Idem (lib. vi, cap. 20, p. 432).

37. *Origen de los Indios* (edition of 1729). The first edition of this important work bears date 1607 and is much less voluminous. Barcia, the editor of the second edition, made some additions to the text.

38. The title of Gomára's Chronicle, second edition, is *Primera y Segunda Parte de la historia general de las Indias hasta el año de 1551*, etc., Medina del Campo, 1553. Gomára was born at Sevilla in 1510; the date of his death is not known to me as yet. Few authors who wrote on Spanish America in the sixteenth century have been so severely criticized by contemporaries as Gomára; but these criticisms apply to incidents of the conquest rather than to the descriptions of customs, or to traditions reported by him. Gomára owed the disfavor he suffered from the Spanish government to his intimate relations with Cortés.

39. I use the reprint of Gomára in vol. 1 of Vedia, *Primera y Segunda Parte de la Historia general de las Indias* (p. 231): "Su naturaleza fué de Tiquicaca, que es una laguna en el Collao, cuarenta leguas del Cuzco, la cual quiere decir isla de plomo; cá de muchas isletas que tiene pobladas, alguna lleva plomo, que se llama tiqui. Boja ochenta leguas; rescibe diez ó doce rios grandes y muchos arroyos; despídelos por un solo rio, empero muy ancho y hondo, que va á parar en otra laguna cuarenta leguas hacia el oriente, donde se suma, no sin admiracion de quien la mira. El principal inga que sacó de Tiquicaca los primeros, que los acaudilló, se nombraba Zapalla, que significa solo señor. Tambien dicen algunos indios ancianos que se llamaba Viracocha que quiere decir grasa del mar, y que trajo su gente por la mar. Zapalla, en conclusion, afirman que pobló y asentó en el Cuzco, de donde comenzaron los ingas á guerrear la comarca." In these statements of Gomara there is something that recalls Betanzos and Cieza, as well as the subsequent tales related by Anello Oliva.

40. Levinus Apollonius, *de Peruanæ Regionis, inter Noui Orbis prouincias Celeberrimæ, inuentione: & in eadem gestis*, libri v, Ant-

werp, 1567 (folio 36): "Tantis per dum ab Titicaca lacu Ingae numerosa multitudine profusi, Cuzconem occuparunt, Apud hos pures onrem summarii vniuersae, quem Ingam Zapalim nominarūt." It is likely that Apollonius copied Gomára and not Zárate.

41. The first edition of Herrera is from 1601-1615. I use the one (edited by Barcia) from 1726, 1728-1730, *Historia general de los Hechos de los Castellanos en las Islas y Tierra firme del Mar Océano*. (3 volumes.)

42. Dr A. von Frantzius, (*San Salvador und Honduras im Jahre 1576*), published in 1873, a "cheap" criticism of Herrera, accusing him of mechanical copying, lack of critical spirit, and the like. Had this German traveler (otherwise a worthy man) studied Herrera with more of the spirit which he accuses the Spanish chronicler of not possessing, he might have modified his opinion.

43. *Historia general*, década v, lib. III, cap. VI, p. 61.

44. Idem.

45. *Las Repúblicas del Mundo*, Salamanca, 1595, vol. III, lib. II, cap. XL, f. 163.

46. *Extirpacion de la idolatría del Perú*, Lima, 1621.

47. *Contra Idolatriam*, MS. quoted by Calancha.

48. There are various treatises and reports by this energetic and active priest. An unpublished one is in my possession as a copy, taken from the original in the Dominican convent at Lima.

49. *Carta pastoral de Exortacion é Instruccion Contra la Idolatria de los Indios del Peru*, 1649.

50. Only the French translation of a part of this work is at my command. Its title is *Mémoires historiques sur l'ancien Pérou*. (Collection Ternaux-Compans, vol. xvii, second ser., p. 3): "Voilà, du moins, ce que j'ai pu apprendre dans les chants historiques et les anciennes traditions des Indiens." Thus, he claims to derive his information from songs and oral tradition. It implies that he regards them as the chief sources. He wrote about 1652. (Preface, p. viii.)

51. *Origen de los Indios*.

52. *Historia del Peru*, lib. I, cap. II, p. 23: "Noticia será esta que no se hallará tan facilmente en las historias, por lo menos con auer visto, leído muchas no la hê alcançado dellas, y en el tiempo que estoy escribiendo esta vinieron á mis manos unos papeles originales, que me dió el doctor Bartholomé Cervantes, racionero de la Sancta yglesia de los Charcas en que hallé con puntualidad lo que muchos años á é deseado saber, y diré aun que solo por relacion del Quipucamayo Catari coronista que fué de los Incas, y lo fueron sus padres y todos lo tuuieron del primer coronista inuentor de los quipos que dixe arriba llamado illa, tomando pues la corriente de su principio." . . .

53. *Historia del Peru*, lib. I, cap. II, pp. 23-37. It is too long to quote in full in the text.

54. Idem (p. 38): "Luego diuidió el Reino en quatro partes que

son las mismas en qué el gran Huyustus antes que començára á reinar su padre Manco Capac lo auia repartido . . . [p. 39:] y passó á las partes de Tyyay Vanacu por ver sus edificios que antiguamente llamaban Chucara, cuya, antigüedad nadie supo determinalla. Mas solo que alli viuia el gran señor Huyustus que decian era Señor de todo el mundo." The word *Huyustus* is somewhat strange. It is neither Quichua nor Aymará, and recalls the way in which the Indians of these parts would pronounce "Augustus."

55. *Historia del Nuevo Mundo*, vol. iv, p. 55: "El adoratorio del sol que estaba en la isla de Titicaca, era una grande y firme peña, cuya veneracion y motivo porque la consagraron al Sol tiene por principio y fundamento una novela bien ridícula, y es, que los antiguos afirman, que habiendo carecido de luz celestial muchos dias en esta provincia, y estando todos los moradores della admirados, confusos y amedrentados de tan obscuras y largas tinieblas, los que habitaban la isla sobredicha de Titicaca vieron una mañana salir al Sol de aquella peña con extraordinario resplandor, por lo cual creyéron ser aquel peñasco la casa y morada verdadera del Sol ó la mas acepta cosa á su gusto de cuantas en el mundo habia; y asi se lo dedicaron y edificaron allí un templo suntuoso para en aquellos tiempos, aunque no lo fué tanto como despues que los Incas lo engrandeciéron é ilustraron.

"Otros refieren esta fábula diferentemente y dicen, que la razon de haberse dedicado al Sol esta peña, fué porque debajo della estuvo escondido y guardado el Sol todo el tiempo que duraron las aguas del Diluvio, el cual pasado, salió de alli y començó á alumbrar al mundo por aquel lugar, siendo aquella peña la primera cosa que gozó de su luz. Como quiera que haya sido el principio y origen deste santuario, él tenia muy grande antigüedad y siempre fué muy venerado de las gentes del Collao, antes que fueran sujetadas por los Reyes Incas."

56. "El camino por donde vino á noticia del Inca y ser tan celebrado fué este . . . uno de los viejos que desde su puericia servia en el ministerio dél, . . . se puso en camino para la ciudad del Cuzco . . . y presentandose ante él con las ceremonias y sumisiones que suelen usar, le dió cuenta larga del origen y veneracion deste santuario, de que el Inca hasta entónces no habia tenido noticia."

57. On the subject of confession, see Alonso de la Peña Montenegro, *Itinerario para Parrochos de Indias*, Antwerp, 1754, lib. iv, trat. iii, secs. i and ii, p. 538 et seq.; Acosta, *De procuranda indorum salute*; Juan de Solorzano Pereira, *Politica indiana*, edition of 1703, lib. ii, cap. xxix, etc., and many other authors.

58. The work of Father Ramos Gavilan is exceedingly rare. I know of only three copies, one of which was taken to Spain by Father Rafael Sans, while two are still in Bolivia. The National Library at Lima has no copy of the work. My friend the Right Reverend Bishop of La Paz, Fray Nicolas Armentia, had the kindness to compare the text of one of these copies with the book of Father Sans, and to furnish me with the title of the original, which is *Historia del célebre y milagroso Santuario*

de la Ynsigne Ymágen de Nra Sra de Copacabana, Lima, 1621. Of the partial reprints of the work by Father Sans there are two rare editions, the first one of which, dated 1860, contains a map of Lake Titicaca, which is by no means indifferent although badly printed, and an outline sketch of Copacavana which is also reasonably exact. It is sometimes not easy to separate what belongs to the original of Ramos from what is due to the pen of his editor, although, thanks to the painstaking collation of Bishop Armentia, it has now become possible.

59. In the first edition by Sans: *Historia de Copacabana y de su Milagrosa Imájen de la Virgen* (1860, caps. 3 and 4, p. 4), Sans says: "Aquí empieza lo obra que compendiamos." He has omitted parts of the original, for the just reason that his copy lacked chapters I, II, and part of chapter III of the work. From the copy made of chapter II by Armentia I obtained what Ramos says concerning the origin of the Inca, and not a word is said in it of Titicaca. The Inca are said to have originated at Pacari-tambo.

60. *Historia de Copacabana* (caps. I-II). This first chapter is from the pen of Sans exclusively. Caps. III-IV, p. 4, mention the story of the old man who went to Cuzco, attributing it to Ramos.

61. *Idem*, p. 54 et seq.

62. *Idem*, cap. VIII, p. 12: "El fundamento de la estimacion de esta isla fué el haberse creído por los antiguos que, habiendo estado en tinieblas algunos dias, vieron despues salir al sol de aquella peña." I call attention to the various versions about the state of darkness in which the region is said to have been plunged. Some authors speak of a long period of obscurity, while others mention only the darkening of the skies during a few days. Such a short period of obscurity occurred in the year 1600, in consequence of the eruption of the volcano of Omate, south of Arequipa, described in *Historia del Colegio de la Compañia de Jesus de Arequipa y Reventazon del Volcan de Omate*, 1600 (MS. in the National Archives at Lima). The obscurity produced by the ashes, even on Lake Titicaca which lies about 120 miles away in an air-line, was such that Ramos (*Historia*, p. 120) says: "Viendose los de Copacabana oprimidos con tan densa obscuridad, sin ver la luna, ni el sol, ni la laguna, ni aun los cerros del pueblo."

63. *Crónica Moralizada*, vol. II.

64. *Idem*, vol. I, lib. II, cap. X, p. 366. "Asentado esto se conforman los Autores en dezir, que en todas las tierras arriba de Chuquiago, Chuquisaca, Potosí i sus comarcas, dōde el Licenciado Polo izo la averiguacion, i en las de Chucuito. . . . [Page 367:] Y así irritado del todo les arrojó tan gran aguacero, i tan inmensa cantidad de agua, que aogó todos los ombres, de los quales se escaparon algunos (no culpados), permitiendoles Dios, que se subiesen en altisimos árboles, en coronas de los encumbrados montes, i se escondiesen en cuevas, i grutas de la tierra, de donde los sacó, quando el llover avia cesado, i les dió orden que poblasen la tierra, i fuesen dueños della, donde viviesen alegres i dichosos. . . . I convirtió á todos los maestros destros adoratorios en piedras duras. . . .

Asta entonces no avia el Pachachayachachic criado al Sol, la Luna i las estrellas, i fuélas à criar al pueblo de Tiaguanaco, i á la laguna Titicaca de Chucuito. El Sol se fué luego al Indio Mangocapac i le prohió é izo Rey. . . ." The story about the deluge has a suspicious analogy with Mosaic tradition ; and that about the changing into stone of the artisans (*maestros*) who made the monuments at Tiahuanaco might easily be a "myth of observation."

65. Ibid., page 93 : "Era natural de Tiaguanaco, ó de algũ pueble-zuelo conjunto á él."

66. *De diva virgine, Copacavana, in pérmano novi mundi Regno celeberrima. Liber vnus, Quo eius Origo, et Miracula compendio descripta*, Rome, 1656.

67. *Imágen de N. S. de Copacavana*.

68. Idem, fol. 19.

69. *Relacion de Antigüedades del Perú*.

70. *Relacion*, page 234 : "Dizen que en el tiempo de *Purunpacha* todas las naciones de *Tauantinsuyu* benieron de hazia arriba de Potosi tres ó quatro exercitos en forma de guerra, y assi los venieron poblando, tomando los lugares, quedandose cada vno de las compañías en los lugares baldios ; á este tiempo se llaman *Ccallacpacha* ó *Tutayachacha* : y como cada vno cogieron lugares baldios para sus beuiendas y moradas, esto le llaman *Purunpachacha Raccaptin*, este tiempo." For the rest see pp. 236-240.

71. I call attention to the darkening of the skies at Copacavana in 1600, in consequence of the eruption of Omate, previously mentioned.

72. Cieza, *Primera Parte de la Crónica*, cap. cxvi, p. 453 : "En el Perú no hablan otra cosa los indios, sino decir que los unos vinieron de una parte y los otros de otra, y con guerras y contiendas los unos se hacian señores de las tierras de los otros, y bien parece ser verdad, y la gran antigüedad desta gente por las señales de los campos que labraban."

AN ARIKARA STORY-TELLING CONTEST

By GEORGE A. DORSEY

Among the Arikara the telling of tales is a common practice, especially during the winter nights. In addition to the great mass of legends and traditions which form the tribal lore, and which are related both in the family circle and during ceremonial gatherings, short tales of personal adventure, generally containing an element of the supernatural, are often recounted among the men during the intervals of a ceremony. The following incidents were related while the food was being prepared for a ceremony at the lodge of Strike-Two, an hereditary chief of the Arikara — the first, by Bull's-Neck :

“ Another man and I went on a buffalo hunt. We saw a bunch of buffalo. We crawled up to them, but they ran away. Every time we came near them they ran away, so we talked and tried to get close to them. One time when the buffalo were in a ravine, we lay down on our bellies and crawled until we came in sight of the buffalo ; then both of us shot, but both of us had aimed at the same buffalo. We went up to the buffalo and commenced to skin it. The other man called me, and said : ‘ Look at the buffalo’s rump ! ’ I looked, and there I saw an eye. We both exclaimed, ‘ No wonder we could not approach the buffalo any closer, for this one has an eye in his rump ! ’ ”

At the conclusion of this tale, the other men began to laugh. After the laughter had subsided, Bull's-Neck continued with the following :

“ That man sitting over there killed a rabbit and brought it to my house. I skinned the rabbit, and on cutting it open I found one large heart hanging down from the heart. The other heart was in its proper place. That man sitting over yonder killed the rabbit and saw the two hearts ; he will tell you if I am telling a true story.”

Again there was laughter, but no one in the circle seemed as yet ready to continue the contest, whereupon Bull's-Neck continued with another tale, as follows :

"I was riding on my pony, hunting my ponies. I went to yonder hills. As I neared the top of the hill I saw an old buffalo skull sitting on top of the hill. As I approached the skull, my pony neighed. As soon as my pony neighed, I saw the skull turn over. That young man yonder was with me, and he knows that what I tell is true. We did not turn the skull back in place, but left it as it turned over, and to this day it is sitting as we left it."

This tale provoked even more laughter than the ones preceding it, and one of the priests spoke up and called the old man a liar. He received the compliment with perfect good nature, and continued with still another story :

"That young man sitting yonder, his wife who is in the other room, and myself, went after wood. We went into a place where there was dry willow. The willows were so thick that I could hardly get through them. The woman called me, and I went. There, where she was, was a young eagle or chicken-hawk trying to fly through the willows, but the wind was blowing hard, so that the willows blew together and the hawk could not fly away. I went to it and hit it with a stick. I then took the hawk and killed it, plucked its feathers, and laid it upon the wood in a wagon-box. I left the feathers upon the wings and tail. I wanted to roast the bird when I reached home. The woman spoke as we started, saying, 'Look at that bird flying ! It looks like the bird you had in the wagon !' The woman further said, 'I believe it is.' I looked for my bird, but it was gone. I looked overhead. I became frightened and went away from the people. I went to the mountains and stayed for several days, but as my bird did not come back, I returned home, and never saw it any more."

By this time, others thinking that they should be given an opportunity, a man named Enemy's-Heart spoke up, saying, "Give us a chance to tell a story ; I will relate to you an incident that is true." And he told the following :

"I went buffalo hunting with another man. We found a bunch of buffalo cows. We killed one that looked rather thin, and hollow in the belly as if it had no entrails. The other man then took some grass and began to rub it upon the buffalo. I said, 'You are not doing right ; this is the way to do that !' I took some wild sage and began to rub the buffalo with it, over the belly, under the fore-legs, and all over. I was grunting all this time. When I was through, I said to the other man, 'Now cut the buffalo upon the breast and see if there is any fat.' The other man cut the buffalo

open, and when he did so, he said, 'Why, you have done something wonderful ; you have made the buffalo fat !' We skinned the buffalo, and when we got to the belly, we noticed that it was very hollow. I cut the leg off at the shoulder ; then I cut the shoulder. While I went to find a stone to sharpen my knife, the other man called me, and said : 'This cow has a calf in her, but it is not in her womb, but in her paunch !' Surely a calf was moving in the cow's paunch ! We took out the paunch, laid it aside, and went home with our meat. The people did not believe us, so we took them to the place, and they saw the calf in the cow's paunch."

Upon concluding, Enemy's-Heart turned to old Bull's-Neck and said, "All this that I have told you is true." All now laughed, and Enemy's-Heart continued, relating the following :

"I was hunting antelope in the winter time. I killed two. I skinned them, and left the meat upon the ground. I went home and caught my ponies and took another man with me to where the meat was. We packed the ponies, then we went on. We came along the Missouri river. I saw a jackrabbit sitting close to the road. The other man called my attention to the rabbit. I got off my pony, took aim at the rabbit, and shot it. We went, and to our great surprise we found a deer lying there in place of the rabbit. This rabbit had turned to a buck, for it had long antlers. We skinned it and took the meat home. When I got home I related the incident to some old men. I was afraid it meant something bad ; I felt strange and scared. When the old men told me it was all right, I felt better. I kept the hide and antlers for many years."

At the conclusion of this story, Bull's-Neck seemed somewhat provoked, and exclaimed : "You could not do what you say you did ; your story is not true ! It reminds me, however, of an experience which I once had and which is true." Whereupon he related the following :

"I was out hunting one day with another man. I climbed a hill, and saw a buffalo sitting in the hollow. I could plainly see his horns. I called for the other man and told him that there was a buffalo sitting down in the bottom, but he would not believe me. I then told him to look. He turned to me, and said, 'I do not see any buffalo sitting down, but I see one lying down ; it is dead ; I do not believe it is alive.' I then said, 'I am sure it is alive !' So we went to where the buffalo lay, and if the buffalo had jumped up and attacked us, both of us would have been hurt. So we walked, holding each other. We came up to the buffalo. It was not

breathing, nor alive. The legs were crossed. We took our whips and whipped the buffalo. The buffalo was not sleeping, for it jumped up and snorted. We ran away from the buffalo, and the buffalo ran another way."

Again there was laughter about the circle, the implication being that Bull's-Neck's tale was not founded on fact. The old man looked very sober, and exclaimed, "But I had another experience, equally curious," and related the following incident:

"I was walking from yonder hills and came across a coyote. I caught hold of its tail and began to drag it. I came far away from the hills, when all at once the coyote moved about and ran away from me. It must have been asleep. I watched it as it went across the prairie, and said to myself, 'Why did I not kill it?' Well, the coyote ran away from me."

At the conclusion of this tale by Bull's-Neck, an old warrior named Bear's-Teeth, one of the hereditary chiefs of the Arikara, related the following:

"A young warrior had been dreaming about the eagles. One night this young man had a dream. He saw an eagle in his dream, and it said, 'You must wear the eagle-feather through your scalp-lock for the next few days.' The next day the man took one of his eagle-feathers and cut it at the end; then he placed the feather through his hair. The next night this man had a dream. The eagle came to him and said, 'You have done wrong. I fly high. No one can cut my feathers. If you cut my feathers, tomorrow you will be cut.' The man arose and went out of his tipi. He looked over the country. No enemy was in sight, and he said to himself, 'That eagle came to me in my dream; I will not think about it any more.' As he went into his tipi again he heard some one yell, 'Enemy coming!' The man rushed out, mounted his pony, and went toward the enemy.

"In the battle that followed, this man and a Sioux attacked each other on horseback. As they approached they got off their ponies and grappled with each other, each taking out his butcher knife. The man who had the dream was stabbed under the left arm. The Sioux was killed, and the Arikara was brought home wounded.

"In the night he saw the eagle, who said, 'You are not to die; you are to live.' The next day the man told his friends that he was to live, that he had seen the eagle in his dream. The man recovered and became one of the principal men of the Arikara."

By this time the announcement came to the lodge that the food was ready for the feast, so the story-telling ceased.

RACIAL DIFFERENCES IN PALM AND SOLE CONFIGURATION

BY HARRIS HAWTHORNE WILDER

INTRODUCTION

A comparatively small number of investigators have interested themselves in the epidermic markings on the volar surface of the human hand and foot, and of these but two have suggested in them a possible ethnographic value. The first was Arthur Kollmann, ('83 and '85)¹ who made use of all the opportunities afforded him and studied the actual palm and sole surfaces of numerous representatives of various races. He did not employ, and probably did not know, the method of printing the surfaces, and studying these impressions instead of the actual objects, and his observations were thus not only extremely difficult to make, but impossible to record more than in a general way ; in addition to which came the greatest disadvantage of all — that of not being able to study a large enough number of individuals of any given race to eliminate the individual variation. Thus, in the comparison of hands, his list included two Chinese ; two Japanese ; two Turks ; three Armenians ; three native Australians, then on exhibition in Berlin ; two African negroes, both with white blood ; and six negroes from America. In the investigation of soles he fared better, making use of several traveling troupes on exhibition in Berlin, although by this means he must have studied in each case closely related individuals, and thus have been liable to have taken merely family characteristics for those of racial value. Here his list included 21 Ceylonese, 21 Kalmucks, 1 Armenian, 1 Australian, a number of African and several American negroes, and several Araucanians from Chile.

Although in this latter case, that of the feet, Kollmann possessed material enough for some results, had he employed prints and had he selected unrelated individuals, his standpoint was not

¹ See the Bibliography at the close of the article.

quite right for the production of definite results, since in the first place he studied patterns alone and had no knowledge of main lines, triradii, and other essential features, and in the second, his main endeavor was to find Simian characteristics in the lower races, a condition which he thought *a priori* probable. In this he came to no definite results.

The other investigator along this line was Francis Galton ('92) who, as in all his work, confined his comparison to the finger-tips. His results also were indefinite.

Aside from these two investigators it should be mentioned that Hepburn ('95) investigated the feet of a dead negro, and speaks as though he had had other cases under observation. In these he finds nothing, however, which he could not have seen equally well in members of his own race.

The present paper is the result of the suggestion made by me a year and a half ago¹ that "it would be of much interest to compare the sculpture of the palms and soles in the various races of men, as it is at least possible that *there may be sufficient difference to constitute important racial characteristics.*"

As the method of treatment of this subject is largely by the employment of descriptive formulæ, and as information concerning these is in part scattered through various former papers of mine,² and in part has not yet been published, it seems best to begin this paper with a brief description of the essential features found in palms and soles, and with instruction concerning the method of writing descriptive formulæ expressive of the conditions found in individual cases.

I.—PALM AND SOLE CHARACTERS, AND THE METHOD OF RECORDING THEM BY MEANS OF DESCRIPTIVE FORMULÆ

The Palm. — The palmar configuration in man has become more modified than has the sole, and is thus simpler in its configuration,

¹ "Palms and Soles," *Amer. Jour. of Anatomy*, vol. I, p. 434.

² Facsimile prints, marked by the main lines and other features, and showing both palms and soles, are given in *Amer. Jour. of Anatomy*, vol. I, No. 4 (Sept., 1902), and in *Popular Science Monthly*, Sept., 1903. Two palms (Maya) and two soles (Negro), similarly marked, appear as plates x and xi of this article. These will be of much help in understanding the general description immediately following.

though secondarily so. The method employed in describing it has therefore only a remote relation to the original morphology of the parts, but seems well fitted to its actual condition.

In its interpretation the first points to be established are the *four digital triradii* situated below the bases of the four fingers. From each of these points three lines radiate which are to be followed on a print by means of pen or pencil as far as they may be followed without crossing any of the ridges. Of these three lines, the *radiants*, two of them pass upward between the fingers and serve merely to define small triangular *digital areas*, which in reality belong to the systems covering the volar surfaces of the fingers and have intruded themselves like small wedges upon the palm. The four remaining radiants, one from each digital triradius, traverse more or less of the palm, though with a great variety of possible relations and interrelations, and are termed the *four main lines*, since by locating these the general topography of a given palm is outlined. They are designated by the capital letters A-D, beginning on the inner or radial side. As their origins are from points relatively fixed in position, their courses can be expressed with sufficient accuracy by locating their termini, and this is readily done by means of the artificial numerical scheme shown in fig. 2, *a*, in which numbers are arbitrarily fixed to the various marginal points and interspaces in which these lines may terminate. The courses of the four main lines are thus designated by a formula consisting of four figures, the order being, for several reasons, the reverse of the usual one, beginning with line D, the fourth one, instead of A, the first. In rare cases, especially in line D, the main line meets a lower triradius, thus being prevented from reaching the margin at any point. When this occurs, the radiant forming the continuation of the main line is followed and its terminal number employed, thus reducing the condition to that of a normal line bearing a triradius at a given point along its course. The existence of the triradius is indicated in such cases by the use of a small *t* added as an exponent to the number. Examples of main line formulæ arranged in numerical sequence for ease in reference are shown in tables II and III.

Aside from the above, the conditions near the wrist should also be noted. Here, in perhaps the majority of cases, there is found a

well-defined *carpal triradius*, the presence of which is indicated by a C added as a fifth term to the main line formula ; but occasionally the lines of the ulnar and radial regions merely diverge, forming what may be considered the upper portion of an extra-limital triradius, or one which does not appear since its location would be on the normal skin beyond the limits of the ridges ; this condition is expressed in the formula by P, i. e., a “*parting*.” Various modifications of these two conditions are easily expressed by means of Galton’s device of “descriptive suffixes” in the form of exponents, many of which are used in table VI and explained just below it. See also the list of abbreviations, pages 253, 254.

Patterns in form similar to those of the finger tips may occur in several places, namely, on the *thenar* and *hypothenar* regions and on either of the three interspaces included between the main lines, the *three palmar areas*. Of these patterns the hypothenar, when present, has always a genuine morphological value, and is directly descended from one that is more constant in appearance in lower forms ; the thenar is really the equivalent of two, and is often indicated as such by being composed of two loops placed in opposite directions ; and the three palmar patterns may either be *true* (i. e. of morphological value), or *false* (i. e., of accidental occurrence). The former is always accompanied by an extra triradius called a *lower triradius*, which assists in its formation, but the latter is formed merely by the abrupt recurving of one of the main lines, and is without trace of triradius.¹

In formulation the hypothenar and the thenar are designated by H and θ respectively ; the three palmar patterns are designated by the numbers 1–3, and their nature is indicated either by an exponent, *l* for a loop, or false pattern, and *t* (triradius) for a true one ; or by the words “loop” and “triradius” as in table VII.

This brief description of palmar characters and their formulation is very incomplete and may be supplemented by my former papers on the subject, especially that in *Popular Science Monthly*, September, 1903.

¹ The distinction, although a practical one, may not in all cases be strictly true from a morphological standpoint, since it is conceivable that a true pattern may, through suppression of radiants, be practically without the characterizing lower triradius. For a fuller treatment of this matter see Miss Whipple, 1904.

The Sole. — There are many practical difficulties in the way of an attempt to formulate the sole by the method employed in the case of the palm, the principal ones being the following :

1. The more primitive character, and hence the greater complexity of the sole.

2. The frequent location of the digital triradii and other important features in the concavity between the ball of the foot and the balls of the toes, where printing cannot well be done.

3. The more frequent occurrence of large and important lower triradii, the radiants of which are extensive and enter into important relations with the main lines and other parts.

Of these difficulties the most serious is the second, which points out the incompleteness of an ordinary print, and urges the employment of a system which makes use of those parts always shown in a print, and which are not in any way dependent upon digital triradii or other features apt to be beyond the limit of a usual impression. As a series of designations of marginal and other topographical points may be occasionally needed, I have prepared for that purpose a sole-diagram comparable with that of the palm, and given above in connection with it (fig. 2, *b*). If one abandons the main lines as too uncertain in determination to be used as a starting-point, the most natural, because the most conspicuous and universal, character would be the *hallucal pattern*, that upon the raised eminence below the great toe. This feature can be seen with great ease, and with a little practice its type may be determined with accuracy upon the natural foot, thus making it a matter of the greatest convenience in such practical cases as the identification of burned or otherwise badly mutilated bodies. This is the most primitive pattern found in man and quite frequently exhibits the typical arrangement of ridges as seen in fig. 3, *a*. This is the primitive whorl type, and shows for its core a succession of concentric circles, which are frequently very perfect. This core, which is often quite extensive in area, is bounded externally by three triradii, each embracing the core with two of its radiants like a capital Y, while the third radiant, known as the *divergent*, extends directly away from the center of the pattern. In conformity with other mammalian patterns, the three triradii are designated as the *outer*

(a), the *inner* (b), and the *lower* (c), but it must be remembered that *these terms refer to these positions relative to the entire foot rather than to the print*, and that they are applied in conformity with a general

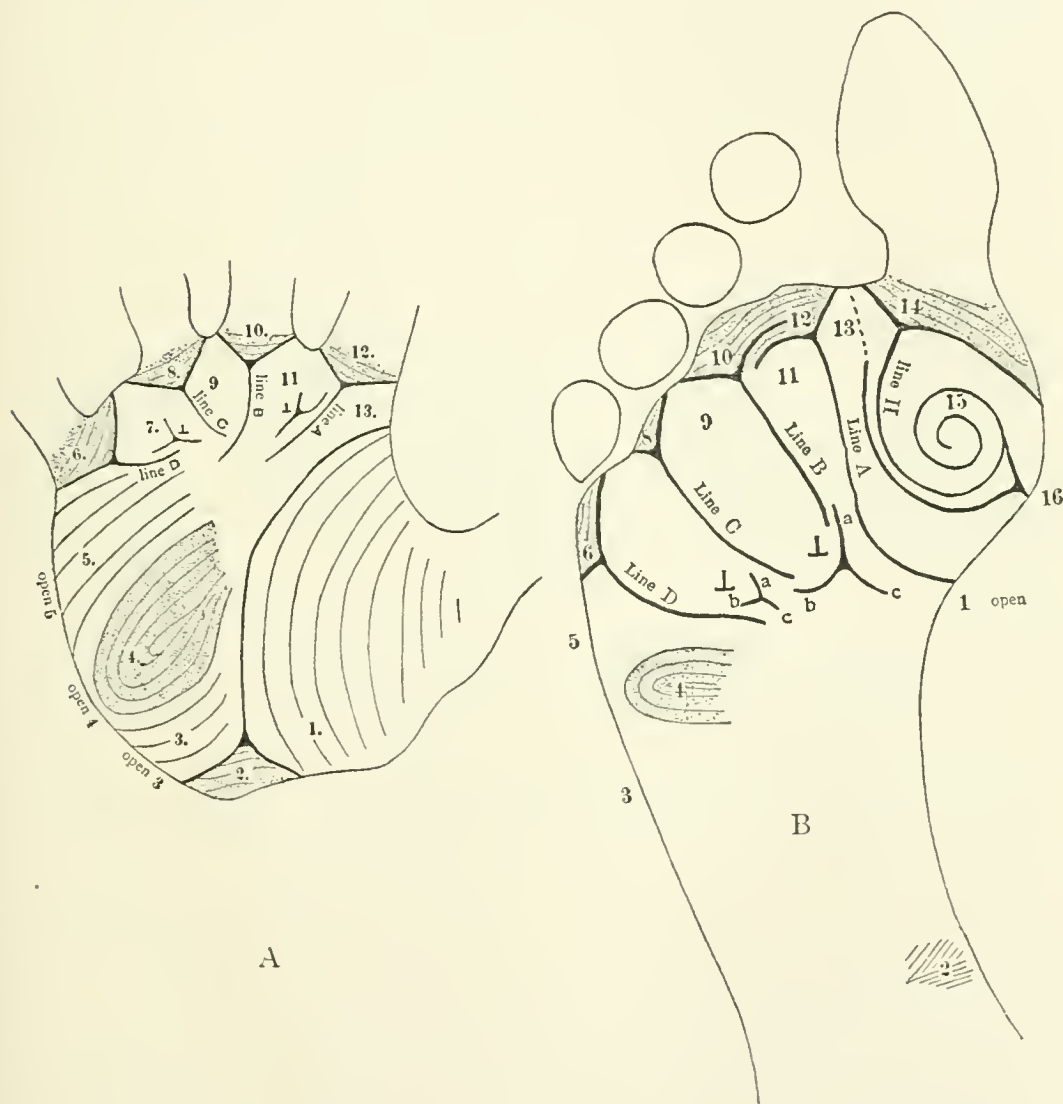


FIG. 2.—Diagrams of human palm and sole, to illustrate the method of designating individual conditions by means of descriptive formulæ. (From *Popular Science Monthly*, Sept., 1903 ; by permission.)

morphological principle rather than with reference to this especial place. It will be easier to remember these as *a*, *b*, and *c* respectively, designations which will be seen to have a meaning in the system here proposed.

Such a typical pattern as the one given in fig. 3, *a*, is termed a *whorl*, and designated in a formula as W, but there may be various

modifications of this. Of these the commonest is the suppression of the divergent of triradius *c* which gives the entire pattern a rounded aspect on its outer border. Such a condition may be designated as W^d . In like manner we may express a reduction (not a loss) of either of the other triradii as W^a and W^b , the first of which is not uncommon. Lastly, the core may become modified as a spiral (very common in the white race) or as an S-shaped

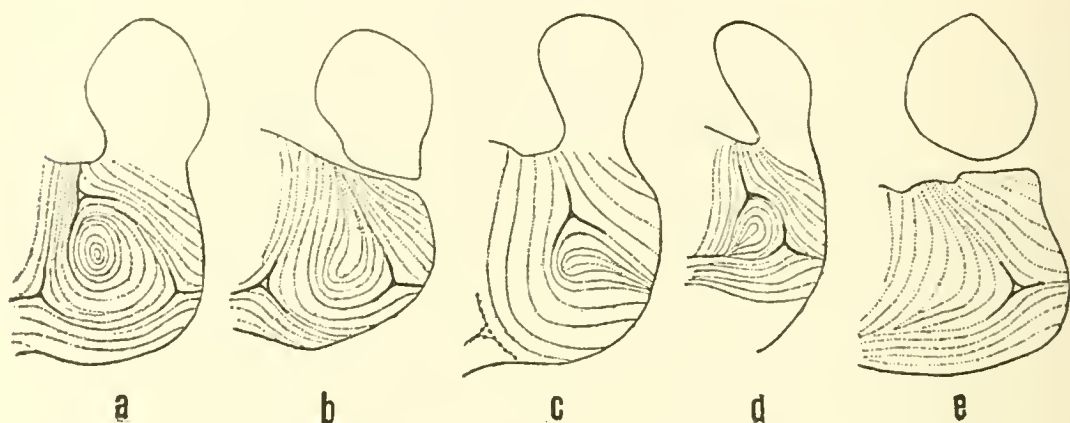


FIG. 3.—Types of hallucal patterns; tracings from actual cases. Two-fifths natural size. *a*, Cat. No. 338, Maya; primitive type, embraced by three triradii. *b*, Cat. No. 337, Maya; type A, pattern opens through outer (upper) triradius. *c*, Cat. No. 301, Chinese (right reversed), type B, pattern opens through inner triradius. *d*, Cat. No. 58, white; type C, pattern opens through lower triradius. *e*, Cat. No. 338, Maya (right reversed); type AC, pattern opens by both outer and lower triradii.

figure, and these conditions are designated by the exponents *sp.* and *s.* respectively, either with or without other exponents. Thus we may have W^s , W^{ds} , W^{asp} , etc.

This typical pattern often degenerates through the loss of one or more of its triradii, and the consequent opening up of its ridges in the direction of the missing triradius. A triradius may simply suffer the obliteration of its divergent, as frequently in the case of triradius *c*, without allowing the pattern to open; but if really gone, the ridges, no longer enclosed by the embracing radiants, will, as it were, gush forth to the margin of the print. There are, of course, three main types of these, easily designated by the capital letters A, B, and C, to correspond with the triradii which have given way (fig. 3, *b-d*), but occasionally a pattern may open at two of these points, thus making the rather unusual conditions of AB, AC, or

BC. These various conditions, although they may be laborious to describe, are readily understood when first seen, and easily recognized afterward. Where the filing and cataloguing of a large number of sole-prints becomes a necessity, as in an identification bureau, it is recommended that the type of hallucal pattern be made the first term in the formula, a logical sequence of which may easily be made, the symbols being arranged in alphabetical order and subdivided by their exponents.

The further description of the sole is best made by studying the various conditions of the three plantar areas, corresponding to the three palmar areas of the hand, and although the four main lines which delimit and designate these may usually be made out, a little practice will enable one to locate the areas with considerable precision even without this aid, and in cases where no digital tri-radii appear on the print. This plan is similar to the one first suggested by me for use in the case of the palm (1902 b) and differs from the method now employed and described above mainly in laying the emphasis upon the areas themselves, their interrelations and their patterns, rather than upon the lines which bound them.

In describing a plantar area the number of characters to be expressed is not large, and the principal varieties, together with the abbreviations recommended for use in descriptive formulæ, are the following :

1. *An open area*, i. e., one whose ridges reach the margin of the print. Of these there are two possible forms, one in which the opening is upon the inner margin (O) and one in which the opening is to the outer margin (5). The first is very common, the second rare. A narrow opening, that is, one consisting of a few ridges only, is expressed by Oⁿ.

2. *A closed area*, i. e., one whose ridges do not reach either margin, being stopped or turned back by some other formation. This latter may be either another area which curves around its lower end, or a lower tri-radius which embraces the area with two of its radiants. The symbol for a closed area is Cl and the agency of a tri-radius is expressed by an exponent t. Aside from the usual form of the lower end of a closed area, which is that of a rounding curve, there sometimes occurs the form expressed as Cl^r, in which the area comes to a sharp point; also the form Cl^f, somewhat like the last but with the point more prolonged and curved around an adjacent area.

3. *Confluent areas*, or where the ridges are continuous from one to another. This is designated by a + sign followed by a number designating the area with which it is confluent. Thus + 1, applied to area 2 or area 3, would mean that the ridges of the area in question curve or flow around into the territory of area 1, and so on. A confluence is seldom complete for either area involved, and still more rarely mutually so. In such cases, those of *semi-confluent* areas, the condition is expressed by two or more symbols expressive of the course of the various ridges, or rather, groups of ridges, always beginning with those nearest the great toe (inner or tibial side). Thus, in designating area 2, the expression Cl' + 3 would signify that a part of its ridges, those nearest the inner side, were enclosed by the radiants of a lower triradius, and that the remainder were confluent with area 3.

4. *An area looped above*. — This occurs most frequently in the case of area 1, although not unknown in the others, and consists of a series of curved ridges which define the upper border of the area. This condition, formulated as L, and added to the other designations of the area, is produced by a downward curve of one or both of the digital lines that lie adjacent to the patterns, which occasionally meet and form an arch, but more frequently pass one another, one of these running along the digital areas above the plantar areas, while the other curves downward and becomes involved with these latter in various complex relations.

The above set of symbols have proven fully adequate in the description of the 184 separate soles formulated in this paper, and it seems reasonable to suppose that the system will prove sufficient for all cases, at the most by the addition of a few exponents that will easily suggest themselves.

To the above formulæ may be added the symbol H to express a hypothenar pattern when present, and that of K to represent a *calcar*,¹ the very unusual pattern occurring on the heel. These may all be united into a single formula of six possible places, giving in order the conditions of (1) the hallucal area, (2-4) the three plantar areas, (5) the hypothenar, and (6) the calcar. The first practical use of this system is the one used in this paper and seen in tables VIII, IX, XVII, and XXII, below.

Aside from the sole characters above provided for, lower tri-

¹ The phonetic form of this symbol seems advisable in order to distinguish it from the C of the carpal area.

radii are of great morphological importance, but it has been thought best not to consider them save by a few descriptive exponents in formulating sole conditions. They receive some special attention farther on, under the description of Maya feet, where they assume special importance.

For the reader's convenience there follows here a list of the various symbols employed in the descriptive formulæ of palms and soles, together with their meaning; in most cases the use of the descriptive exponents is explained also in connection with the tables in which they are used.

CLASSIFIED LIST OF ABBREVIATIONS

I. — The Main Features

PALMS

Lines A–D. The four main lines.
 d_1 – d_4 . The four digital triradii.
 1–13. As applied to the main lines, these numbers express the point of termination. (See diagram, fig. 2, *a*.)
 C. Carpal triradius.
 P. Parting.
 H. Hypothenar pattern.
 θ . Thenar pattern.
 1–3. As used in the pattern formula, these numbers signify the three palmar patterns.
 \perp_1 – \perp_3 . A lower triradius; the small figure with it indicates the palmar area with which it is associated.

SOLES

Lines A–D. The four main lines; seldom used.
 W. Hallucal pattern of the whorl type.
 A. B. C., AB., BC. Various types of hallucal pattern derived from W by the breaking down of certain of the triradii. (See above.)
 Area 1–3. The three plantar areas.
 1–16. As applied to the main lines, areas, etc., to expressed termini; seldom used. (See diagram, fig. 2, *b*.)
 O. An open area, i. e., one that opens to the inner margin.
 Cl. A closed area.
 + (with 1–3 added). An area confluent with the one indicated by the number.
 L. An upper loop, i. e., one bounding the top of an area.
 \perp_1 – \perp_4 . A lower triradius; the small figure with it indicates the plantar area with which it is associated.

II. — Descriptive Exponents

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| <p>1. IN CONNECTION WITH THE CARPAL TRIRADIUS (C)</p> <p>x. Large triangle, forming triradius.</p> <p>h. High.</p> <p>l. Low.</p> <p>o. Toward the outer margin.</p> <p>c. Central.</p> <p>p. Like a parting.</p> <p>H. Connected with the hypothenar pattern.</p> <p>2. IN CONNECTION WITH A PARTING (P).</p> <p>b. Oblique in direction.</p> <p>bt. Oblique, ending in a triradius.</p> <p>btr. Oblique, ending in a rudiment of a triradius.</p> <p>ct. Like a carpal triradius.</p> <p>3. IN CONNECTION WITH THE PATTERNS (1-3)</p> <p>r. Rudimentary (i. e., vestigial).</p> <p>l. False ; formed by a loop of a main line.</p> <p>t. True ; formed by a lower triradius.</p> <p>u., d., <i>up</i> and <i>down</i>, referring to the upper and lower loops forming the "thenar" pattern. Morphologically the upper loop is a first interdigital, belonging in the series with the other palmar patterns (1-3), while the lower loop is the true thenar. u, d, and ud indicate the presence of one or the other of the loops, or of both.</p> | <p>4. IN CONNECTION WITH THE HALLUCAL PATTERN</p> <p>a. the outer (= upper) triradius.</p> <p>b. the inner (= marginal) triradius.</p> <p>c. The lower triradius.</p> <p>[Either of these attached as an exponent to a W signifies that the given triradius is small and almost broken through ; thus almost forming the type represented by the corresponding capital letters.]</p> <p>d. The common form where the lower triradius does not appear through the loss of its divergent, i. e., where the ridges bordering the pattern on its outer side curve around it without showing a triradius.</p> <p>w. Almost a whorl.</p> <p>sp. Core in the form of a spiral.</p> <p>s. Core an S-shaped figure.</p> <p>sm. A long seam, or line of interruption of the ridges, showing the beginning degeneration of a triradius.</p> <p>5. IN CONNECTION WITH THE PLANTAR AREAS</p> <p>j. An area curves with its lower end around another area.</p> <p>v. The ridges of an area converge below to a point or nearly so.</p> <p>n. Open but very narrow.</p> <p>t. Limited below by a triradius.</p> |
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II. — STUDIES OF VARIOUS RACES

A. — MAYAS

Material. — For the purpose of testing the ethnological value of the palm and sole markings one could hardly wish for better

material than that furnished by the Mayas of the interior of Yucatan, which, although confessedly no longer a pure race, as they may have been when discovered by the Spaniards, are yet remote enough from other influence to have retained in great part their original characteristics.

For the valuable material upon which I have based my studies of the Maya people I am indebted to Mr Alfred M. Tozzer, of the Peabody Museum at Cambridge, Mass., who, at the cost of much trouble and personal inconvenience, has obtained for me the prints — either full sets or those of the hands alone — of 22 individuals. As may be expected, it is no easy task to obtain prints of primitive races, and since, as stated by Mr Tozzer in a letter written during the work, “each print, especially those of the feet, represents a certain amount of coaxing and arguing to overcome the natural prejudice of a half-civilized people,” my debt to him for this valuable material increases in proportion.

TABLE I.—*Lists of Prints used in the Study of the Mayas.*¹

No.	NAME.	SEX.	RELATIONSHIP.	TRIBE.	REMARKS.	PRINTS ²
331	Juan[a] Miz	♀	Sister of 342	Maya	“Undoubtedly a good deal white”	H—
332	Juan Marquez	♂		Mexican		H—
333	Benito Can	♂	Brother of 334 and 335	Maya	} “Fairly pure Indian”	H.F.
334	Luis Can	♂	Brother of 333 and 335	Maya		H.F.
335	Crisostomo Can	♂	Brother of 333 and 334	Maya		H.F.
336	Clotilde Vegara	♀	Niece of 337	Maya	“A little white blood”	H—
337	Leona Cordero	♀	Mother of 350	Maya	“A little white blood”	H.F.
338	Felipe Neo	♂		Maya		H.F.
339	Petrona Coroo	♀		Maya	“Wife of Felipe Neo”	H—
340	Ferenin Tus	♂		Maya	} “As pure Mayas as one finds”	H.F.
341	Nestor Tul	♂		Maya		H.F.
342	Martina Miz	♀	Sister of 331	Maya		H—
343	Juan Mex	♂		Maya		H—
344	Juan Ruiz	♂		Maya		H—
345	Anita Chan	♀		Maya	“White blood not very far back”	H.F
346	?	♂?		Maya		H.F
347	Sequeriano Hoye	♂		Maya		H.F
348	Navora Martin	♀	Mother of 349	Maya	“White blood not very far back”	H.F
349	Juanita Martin	♀	Daughter of 348	Maya	“Remarkably white for Maya”	H.F.
350	Juan Herrera	♂	Son of 337	Maya	“A little white blood”	H.F.
351	—	♂		Tabasco	} “Pure Maya stock”	H—
352	—	♂		Tabasco		H—

¹ Collected by Mr Alfred M. Tozzer.

² H = hands ; F = feet

The preceding list of the individuals who furnished the prints, together with the sex, relationship to one another, and comments concerning the race, will show more exactly of what the material consists, and may be useful for later reference.

The remarks are quotations from Mr Tozzer and serve to show "that to find a pure Indian with absolutely no trace of Spanish blood is almost impossible." Whether it is because of this that the prints in so many respects resemble those of the white race, or whether we would find the case similar in an absolutely unmixed people like the Andamanese, is impossible to say. All that can here be done is to present the conditions found in these Maya prints as impartially and exactly as possible, to formulate what conclusions seem to me to be warrantable, and then to leave the matter to the judgment of the reader.

Palms. — The first discussion will be naturally that of the main lines, including the carpal condition, which will map out for us the general outlines, after which may be considered the patterns and other details. Of the 22 sets, two of them, the right hands of Nos. 346 and 351, could not be read; the remainder, consisting of 22 lefts and 20 rights, were extremely satisfactory. Of these the main line formulæ, placed in numerical order, are shown in table II, as follows :

TABLE II. — *Main Line and Carpal Formulæ of 42 Maya Hands.*

No.	FORMULA.	No.	FORMULA.	No	FORMULA
351 L	7 · 5 · 5 · 1 · C	347 R	9 · 7 · 5 · 3 · C	344 L	10 · 8 ⁷ · 6 · 1 · C
348 L	7 · 5 · 5 · 1 ² · C	350 L	9 ^t · 7 · 5 · 3 · P	337 L	10 · 8 · 6 · 5 · C
343 L	7 · 5 · 5 · 1 · C	338 R	9 · 7 · 5 · 5 · C	352 R	10 · 8 ⁹ · 6 · 5 · C
331 L	7 · 5 ⁸ · 5 · 1 · C	335 R	9 · 7 · 5 · 5 · (?)	332 L	10 · 9 · 6 · 3 · C
349 L	7 · 5 · 5 · 2 · C	336 R	9 ¹⁰ · 7 · 5 ⁶ · 5 · P	339 L	10 · 9 · 6 · 3 · P
342 L	7 · 5 · 5 · 3 · C	352 L	9 · 8 · 5 · 1 · C	342 R	10 ^t · 9 ⁸ · 6 · 5 · C
335 L	7 · 5 · 5 · 3 · C	340 L	9 ^t · 8 · 5 · 1 · C	332 R	10 · 9 · 6 · 5 · C
349 R	7 · 5 · 5 · 5 · C	341 L	9 · 8 · 5 · 5 · C	337 R	10 · 9 · 6 · 5 · C
345 R	7 · 5 · 5 · 5 · C	341 R	9 · 8 · 5 · 5 · C	340 R	11 · 8 ⁹ · 7 · 11 · C
345 L	7 · 5 · 5 · 5 · P	333 L	9 · 9 · 5 · 2 ¹ · C	344 R	11 · 9 · 7 · 5 · C
347 L	8 · 6 · 5 · 2 · C	346 L	9 ¹⁰ · 9 · 5 ⁶ · 2 · C	333 R	11 · 9 · 7 · 5 · C
336 L	8 · 6 · 5 · 3 · C	334 L	9 ^t · 9 · 5 · 3 · C	331 R	11 · 9 · 7 · 5 · C
343 R	8 · 6 · 5 · 5 · C	334 R	9 · 9 · 5 · 5 ^t · C	350 R	11 · 9 · 7 · 5 · P
338 L	9 · 7 · 5 · 3 · C	348 R	9 · 9 · 5 · 5 · C	339 R	11 · 9 · 7 · 5 · (?)

NOTE. — The numerical exponents signify possible alternative interpretation. t signifies a lower triradius in the course of the line. L and R signify left and right.

In the above, 20 separate formulæ are represented, 10 of which occur in left hands alone, 6 in rights alone, and 4 in both. Of the entire number 7 are represented by single hands, 7 more by but 2, and the remaining 6 have 3 or more representatives each. It is of importance to notice that in the first column (14 cases) there are but 3 rights, in the last (also 14) but 4 lefts, while in the middle column the lefts and rights are equally divided. A morphological significance is given to this through the fact that *the formulæ are arranged in accordance with their own numbers, or, in other words, in accordance with the gradual upward movement of the main lines, and that, consequently, in the characteristic human tendency toward a crowding of the ridges upward toward a horizontal position* (Miss Whipple, 1904) *the right hands are considerably in advance of the left.*

This tendency is shown in tabular form as follows :

In 22 lefts, line A takes a position below (5) 19 times or 86%.

In 20 rights, line A takes a position below (5) but once, or 5%.

In 22 lefts, line D takes position (7) 8 times, and position (11) not at all.

In 20 rights line D takes position (7) twice, and position (11) 6 times.

A still more definite proof of this is seen in the relative occurrence in the two hands of the formula 11·9·7·5, which represents the extreme of this tendency. In 20 Maya right hands it is the commonest formula, appearing 5 times, or 25 per cent., while in the lefts it does not occur. This condition might be considered accidental were it not that in 100 right hands of the white race recently investigated, it is also the most common formula, and occurs 22 times (22 per cent.), while in the same number of left hands it is found but 4 times (4 per cent.).¹ The Negro prints (see below) exhibit the same phenomenon. In this same set of whites line A assumes a lower position in 58 lefts and in but 23 rights; line D does not show the tendency as strongly as in the Mayas.

The relative occurrence of the various formulæ of the Maya prints is shown in table III, which may be tested with regard to its ethno-

¹ Table I, p. 402, in "Palm and Sole Impressions," etc., *Pop. Sci. Monthly*, Sept. 1903. This table, together with one deduced from it giving the relative positions assumed by the main lines, will be found in the appendix to this paper.

logical value by comparing it with the table just cited, based on the study of 200 hands of the white race. In these two tables there is a fundamental difference in the relative occurrence of what may be termed the *lower formulæ*, or those in which the first two terms are below 10.8., and the others usually 5 or below. Of these the 42 Maya hands show 28 representatives, or $66\frac{2}{3}$ per cent., while of 200 hands of whites there are but 98 representatives, or 49 per cent. This tendency appears to a much greater extent in the Negroes (77 per cent.), and will be considered at length farther on in this paper.

TABLE III.—Occurrence of Main Line Formulæ in Maya Hands.

FORMULÆ.	L	R	BOTH.	FORMULÆ.	L	R	BOTH.
7.5.5.1	4	0	4	9.9.5.2	2	0	2
7.5.5.2	1	0	1	9.9.5.3	1	0	1
7.5.5.3	2	0	2	9.9.5.5	0	2	2
7.5.5.5	1	2	3	10.8.6.1	1	0	1
8.6.5.2	1	0	1	10.8.6.5	1	1	2
8.6.5.3	1	0	1	10.9.6.3	2	0	2
8.6.5.5	0	1	1	10.9.6.5	0	3	3
9.7.5.3	2	1	3	11.8.7.11	0	1	1
9.7.5.5	0	3	3	11.9.7.5	0	5	5
9.8.5.1	2	0	2				
9.8.5.5	1	1	2	Totals.	22	20	42

Turning now from the study of the formulæ as a whole to that of the various terminal positions of the separate lines, we may find it convenient to construct such a table as the one given here (table iv), which is readily deduced from table III by counting the number of occurrences of each line in each position and tabulating the results. Thus, to give an example, if we take line C, the second row in the formulæ, we can ascertain the number of times it appears in the position (8) by finding each place in which 8 occurs in the second row, and then ascertaining by the right-hand columns the number of times, in each hand, which the given formula represents. Thus, beginning with the formula 9.8.5.1, the first in which line C occurs as (8), we find two left hands and no rights; in the next formula one left and one right; in the fourth below that, 10.8.6.1, one left and no right, and so on, until, when all are computed, it is found that line C assumes the position represented by (8) in 5 lefts and 3 rights, or 8 times in all. The last column under each of the main lines gives the percentage of the whole which the number of

each occurrence in both hands represents; thus the 8 times of occurrence of line C in position (8) are given as 19 + per cent., in the total of 42 hands.

TABLE IV.—Frequency of Occurrence of the Various Terminal Positions, with Percentages (Mayas).

TERMINUS	LINE D				LINE C			
	L	R	Both	% (both)	L	R	Both	% (both)
I	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—
5	—	—	—	—	8	2	10	24—
6	—	—	—	—	2	1	3	7+
7	8	2	10	24—	2	4	6	14+
8	2	1	3	7+	5	3	8	19+
9	8	7	15	36—	5	10	15	36—
10	4	4	8	19+	—	—	—	—
11	—	6	6	14+	—	—	—	—

TERMINUS	LINE B				LINE A			
	L	R	Both	% (both)	L	R	Both	% (both)
I	—	—	—	—	7	—	7	16+
2	—	—	—	—	4	—	4	9+
3	—	—	—	—	8	1	9	21+
4	—	—	—	—	—	—	—	—
5	18	10	28	66+	3	—	21	50
6	4	4	8	18+	—	—	—	—
7	—	6	6	14+	—	—	—	—
8	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—
11	—	—	—	—	—	1	—	2+

This table iv is constructed in the same way as the one published in the article just mentioned, and reproduced as an appendix to this paper representing the positions of the main lines in the hands of 200 whites, and a comparison of the two would show absolutely what differences exist in the relative occurrence of each position in the two races, provided only there were a sufficient number of Mayas to render the percentages perfectly reliable. Something, indeed, may be obtained by a comparison with what I have, as the number 42 is by no means an inconsiderable one, and as proportions should be the subject of comparisons rather than the actual figures in each case, I have prepared table v, in which the percentages of occurrence of the various positions for each main line are

compared for both Mayas and whites. It should be noted, however, that in the tables representing the whites (see Appendix), lines which enter a lower triradius are represented by the symbol alone with no reference to the further course of the line, and as such a nomenclature is insufficient for our present comparison, in order to deduce the percentages given here, I have gone through my collection and replaced this sign wherever it occurs with the definite number representing the terminal position. This will account for a slight disparity in percentages between those given here for the white race, and those stated in the original table.

TABLE V.—*Percentages of the Various Positions of the Main Lines.*

TERMINI.	LINE D.		LINE C.		LINE B.		LINE A.	
	Maya.	White.	Maya	White.	Maya.	White.	Maya.	White.
1	—	—	—	—	—	—	16+	1
2	—	—	—	—	—	—	9+	9.5
3	—	—	—	—	—	.5	21+	20.5
4	—	—	—	—	—	—	—	10
5	—	—	24—	8.5	66+	47	50	58
6	—	—	7+	11.5	19+	13.5	—	—
7	24—	11	14+	33	14+	33.5	—	—
8	7+	12	19+	15	—	5	—	—
9	36—	25.5	36+	26.5	—	.5	—	—
10	19+	13.5	—	5	—	—	—	—
11	14+	38	—	.5	—	—	2+	1

From this final table, which represents the consummation of our labors thus far, as regards the main lines, we may detect what differences there are between the two races, and ascertain the ethnological importance of this comparison; we must remember, however, that the number of Maya prints that serve as a basis for the percentages here given is too small a one to be wholly reliable, and that the heterogeneous set of individuals referred to as the "white race" contain an admixture of very many original strains, hopelessly intermingled since prehistoric times, which can consequently hardly be expected to show any definite racial characteristics. The only fair comparison would be that between 100 individuals each of two relatively pure races, as the Andamanese and the Hudson Bay Eskimo for example, in which the differences may be expected to be more pronounced. As deduced from the above table the Maya main line characteristics, as compared with the somewhat vague standard of the "white race," are as follows:

- (a) *A low, or very low, position of line A.* Sixteen per cent. terminate within the carpal triradius, and 9 per cent. enter this point, making a total of 25 per cent. which open below the free margin, as compared with 10.5 per cent. in the whites. Exactly 50 per cent. of the termini are too low to be counted as (5) as compared with 31 per cent. in the whites. As a hypothenar pattern almost never occurs in the Mayas, position (4) seems to be unknown.
- (b) *Line B seldom terminates above (6) and opens on the outer margin in exactly two-thirds of the cases examined.* In the whites 39 per cent. of B termini are above (6); in Mayas 14 per cent.
- (c) *Line C opens on the outer margin three times as often as in whites (24 per cent. vs. 8.5 per cent.), but is most frequently either obsolete (8) or curved abruptly inward (9) forming a narrow loop.* Fifty-five per cent. of the cases show one of these two relations, as opposed to 41.5 per cent. in the white race. In the latter 5.5 per cent. of the cases pass beyond (9); in Mayas there are no instances of it.
- (d) *The most frequent position for line D is (9), (36 per cent. as opposed to 25.5 per cent. in the whites), and as it is almost universal in those individuals characterized as being the purest Mayas, it may safely be taken as the most typical Maya position.* Next in order is position (7), in which, with its 24 per cent. of instances, it considerably surpasses the 11 per cent. of the white race. A union with line B (10) is also more common than in the whites (19 per cent. vs. 13.5 per cent.).

The results of the study of the carpal region are given in table VI, in which a comparison is also shown by giving at the left similar results deduced from the hands of 100 persons of the white race. This area is usually characterized by the presence of a carpal triradius, which, although in most cases morphologically the lower inner triradius belonging to the hypothenar pattern (Miss Whipple, 1904), is nevertheless independent of this latter in its occurrence, and often appears where there is no such pattern or where the pattern is so far removed from it that its connection is not realized. This is the condition expressed by the first six designations of the table, where the descriptive suffixes refer merely to size and relative position of the triradius; occasionally, however, this triradius is plainly a part of the hypothenar pattern, a relation indicated by the last

two designations C^H and C^{hH} , the latter introducing an additional exponent to signify position. C^p , the seventh designation, signifies a somewhat incomplete triradius that might almost be considered a parting.

TABLE VI.—*Comparison of Carpal Characters in Whites and Mayas.*

WHITES, 200 HANDS.					MAYAS, 40 HANDS.				
Character	Left	Right	Both	%	Character	Left	Right	Both	%
C	31	27	58	29	C	6	4	10	25
C^x	3	3	6	3	C^h	3	2	5	12.5
C^h	6	9	15	7.5	C^L	8	7	15	37.5
C^L	7	5	12	6	C^o	2	3	5	12.5
C^o	2	4	6	3					
C^c	7	8	15	7.5					
C^p	1	3	4	2					
C^H	6	8	14	7					
C^{hH}	6	1	7	3.5					
Total C	69	68	137	68.5		19	16	35	87.5
P	23	24	47	23.5	P	2	2	4	10
P^b	1	1	2	1					
P^{bt}	5	2	7	3.5	P^c	1	—	1	2.5
P^{btr}	2	3	5	2.5					
P^c	—	2	2	1	Total P	3	2	5	12.5
Total P	31	32	63	31.5	Area	9	7	16	40
Area	36	39	75	37.5					

Abbreviations: C = carpal triradius, P = parting, Area = that below the carpal triradius, enclosed by its lower divergents. The exponents are "descriptive suffixes" and are to be interpreted as follows: x = large; h = high; l = low; o = toward the outer margin; c = central; p = like a parting; H = forming a triradius of a hypthenar pattern; b = oblique; bt = oblique, ending in a triradius of the hypthenar pattern; btr = oblique, ending in a rudiment of a triradius; c = like a carpal triradius.

The typical parting, P, is the less frequent case in which the ridges of the wrist merely divide at the middle and pass in two directions, often leaving a small area in the form of a very narrow V. That such a condition is morphologically that of a carpal triradius deficient below and lacking the transverse ridges which are necessary to complete the third side of the triangle, is shown by the existence of such transition forms as C^p or P^c , between which the distinction is often arbitrary. A parting frequently extends in an oblique direction upward and outward to the hypthenar center (P^b) where it may become directly continuous with a triradius, which is mor-

phologically the carpal triradius in a somewhat unusual position. This condition I have designated as P^{bt}, but this passes by almost imperceptible gradations into a simple C. Where the triradius is rudimentary the designation becomes P^{btr}.

Since the carpal triradius is morphologically a part of the great hypothenar pattern which occurs but twice in 44 Maya hands, it might naturally be supposed that the former character would also be infrequent ; *the reverse, however, seems to be the truth, and a carpal triradius occurs in the Mayas in 87.5 per cent. of the cases as against 68.5 per cent. in the whites ; similarly the occurrence of a parting is in the Mayas but 12.5 per cent., and in the white race 31.5 per cent.* The commonest type of carpal triradius in the Maya hand is a very low one, too near the margin to leave room for a carpal area, a type that occurs in 37.5 per cent. of all the hands examined, as opposed to but 6 per cent. in the case of the whites. When a parting occurs in a Maya hand it is of the simplest type, and appears correlated with the existence of white blood. (Compare table II with table I.)

TABLE VII.—Occurrence of Patterns in Palm. (Mayas and Whites.)

DESIGNATION OF PATTERN.	MAYA (44)				WHITE (100)			
	L	R	Both.	%	L	R	Both.	%
Hypothenar.	1	1	2	4.5	20	21	41	41
Thenar (up and down).	12	10	22	50.0	4	3	7	7
1 (Triradius).	0	2	2	4.5	1	1	2	2
2 (Triradius).	0	0	0	0	1	0	1	1
2 (Loop).	5	10	15	34	15	22	37	37
3 (Triradius).	8	5	13	29.5	8	7	15	15
3 (Loop).	7	6	13	29.5	25	19	44	44
Total.	33	34	67	152 ¹	74	73	147	147

The occurrence and comparison of palmar patterns in the hands of Mayas and whites (44 of the former and 100 of the latter) are shown in table VII, in which will be noticed at once the most positive result yet obtained, namely, *that the thenar pattern is characteristic of the Maya hand and the hypothenar of the white.* Fifty per cent. of the Maya hands possess a thenar pattern and but 7 per cent. of the whites, while in the case of the hypothenar the figures are

¹ See note, table XVI.

almost reversed: 4.5 per cent. to 41 per cent. The difference is a little more noticeable if we consider individuals, not hands; since, of the 22 Mayas whose hands appear in the table, 13 were characterized by a thenar and but one by a hypothenar, and of the 50 whites of the same table 24 possess a hypothenar and but four a thenar.

It is important to note that the term "thenar" as used here is employed in its topographical and not in its morphological sense, and implies any pattern or definite pattern rudiment occurring upon the anatomical thenar region. A typical thenar pattern, used in this sense, is in reality a double one, and its most usual form consists

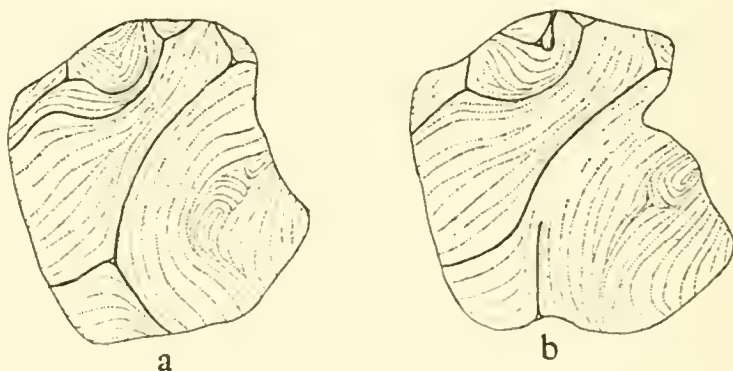


FIG. 4. — Types of Maya palm prints. Two-fifths natural size. Compare with plate x. (a, Cat. No. 352. b, Cat. No. 339.)

of two loops placed end to end, that is, with the sharpest part of the curve of each in contact and directed in opposite ways. (See the Tabasco hand, fig. 4, *a*.) Of these two loops, distinguished in formulæ as *u* and *d* (*up* and *down*), only the lower one (*d*) is in reality a thenar, the upper one (*u*) being the first of the series of interdigitals occurring typically between the various digits, and corresponding to the interval between the thumb and index. Each of these loops, the true thenar and the first interdigital, represents a primitive mammalian pad, and they are brought into this close proximity in the lower Primates as a result of the opposition of the thumb. In a topographical "thenar" pattern, either of these two loops may be alone represented (fig. 4, *b*), or both may occur side by side; or, again, one may be well developed and the other more or less rudimentary, consisting perhaps of a few oblique lines without a loop (plate x). Thus in the 22 instances among the Mayas, four (two rights and two lefts) exhibit the upper loop alone, six



PALM PRINTS OF MAYAS, SHOWING THENAR PATTERNS (NATURAL SIZE)

A, Catalogue No. 344; formula: 10.87.6.1.C^h. *B*, Catalogue No. 342; formula: 7.5.5.3.C^o.

(three rights and three lefts) the lower one alone, and the remaining 12 both loops, at least as rudiments, seven in left hands, and five in rights. Of the seven thenars that appear in the 100 white hands, one is represented by the upper loop, three by the lower, and the remaining three by both, the patterns, when they occur, being as typical and well-developed as in any Maya. In the other patterns, the 1st-3d palmar being those of the 2d, 3d, and 4th interdigital pads, respectively, a distinction is made in the table between true and false patterns, the former, which are the only patterns in the morphological sense, being those in which a definite triradius occurs, other than the digital one. False, or loop, patterns are defined by the recurving of a main line, most commonly line C, and seem to be merely the result of the general upward tendency of the ridges in the (human) attempt to place them in the horizontal position, i. e., straight across the palm. A comparison of these patterns does not reveal any marked difference in the two races, the 2 (loop), for example, showing relatively 34 and 37 per cent. In pattern 3 the Mayas are more apt to show a true one (with a triradius), but if both types of pattern be added in each race, the result is 59 per cent. in both Mayas and whites. In fact, the total occurrence of patterns is remarkably constant in the two races, being, in comparison with the number of hands studied, 152 per cent. in the Mayas and 147 per cent. in the white race; and a similar constancy of occurrence is noted in each race in the rights and lefts. In this connection it is noteworthy that the percentages of thenar and hypothenar are nearly reversed in the two races, thus retaining the average occurrence of patterns.

Summary of Maya Palm Characteristics.

- (a) *Main lines*: A large percentage of occurrence of the "Lower formulæ," in which the position of line A is apt to be especially low (3), (2), or (1), showing that there is a pronounced downward slant to the ridges crossing the palm. Line B opens to the outer margin twice as often and line C three times as often as in the white race, although for the latter line the most frequent position is (9). This same position (9) is also the most characteristic one for line D, and seems to occur in proportion to the purity of the Maya blood.

- (b) *Carpal area*: A carpal triradius is almost universal, the characteristic type being a very low one at the margin of the print, and with almost no carpal area; a parting is rarely found, and seems in every instance to indicate white blood.
- (c) *Patterns*: A great frequency of the thenar pattern, and a corresponding rarity of the hypothenar, the percentage of occurrence of the two being about the reverse of that in the whites; a third lower triradius, and consequently a true pattern 3, is much more frequent than in the whites, but the sum total of both triradius and loop patterns is the same in the two races.

Soles.—As shown above, the configuration of the human sole does not lend itself as readily to expression by means of brief descriptive formulæ as does the palm, and this for two main reasons; first, that the friction skin, bearing with it certain elements essential to the complete interpretation of the configuration, extends up on the sides of the foot considerably beyond the region of contact, or that of an ordinary print, and, secondly, that the conditions are often much more complicated than in the palm. Thus certain of the digital triradii are apt to be situated in the hollow under the toes, where no satisfactory print can be obtained, both because of the abrupt curve of the surface as well as from the fact that the ridges in this sheltered locality are soft and poorly developed. The great complexity of many soles is due (1) to lower triradii, which are not only far more frequent than in the palm, but possess a more extensive influence, entering into various relations with the main lines and other features; (2) to the tendency of the digital lines to become recurved and to run over the sole; (3) to the fact that the interdigital areas are, for the greater part, in contact with one another, without the intervention of intermediate areas; and (4) because the patterns themselves are apt to be more complex.

In attempting, then, the study and comparison of the soles of various human races, I find it impracticable to use main line formulæ or to conform in other respects to the method found serviceable in the case of the palm, but prefer to substitute for them features which seem the most available for comparison, the hallucal patterns and the interrelations of the various areas, points that appear clearly marked upon all ordinary prints, and which are in themselves easily described and formulated.

If, after becoming well accustomed to the sole configuration in members of our own race, one turns, as I have done, to a set of Maya sole-prints, they will produce at once an impression both of excessive similarity to one another and of a general unlikeness to those with which he is familiar. This is seen in the four outlines presented in fig. 5, which represent nearly the widest range of

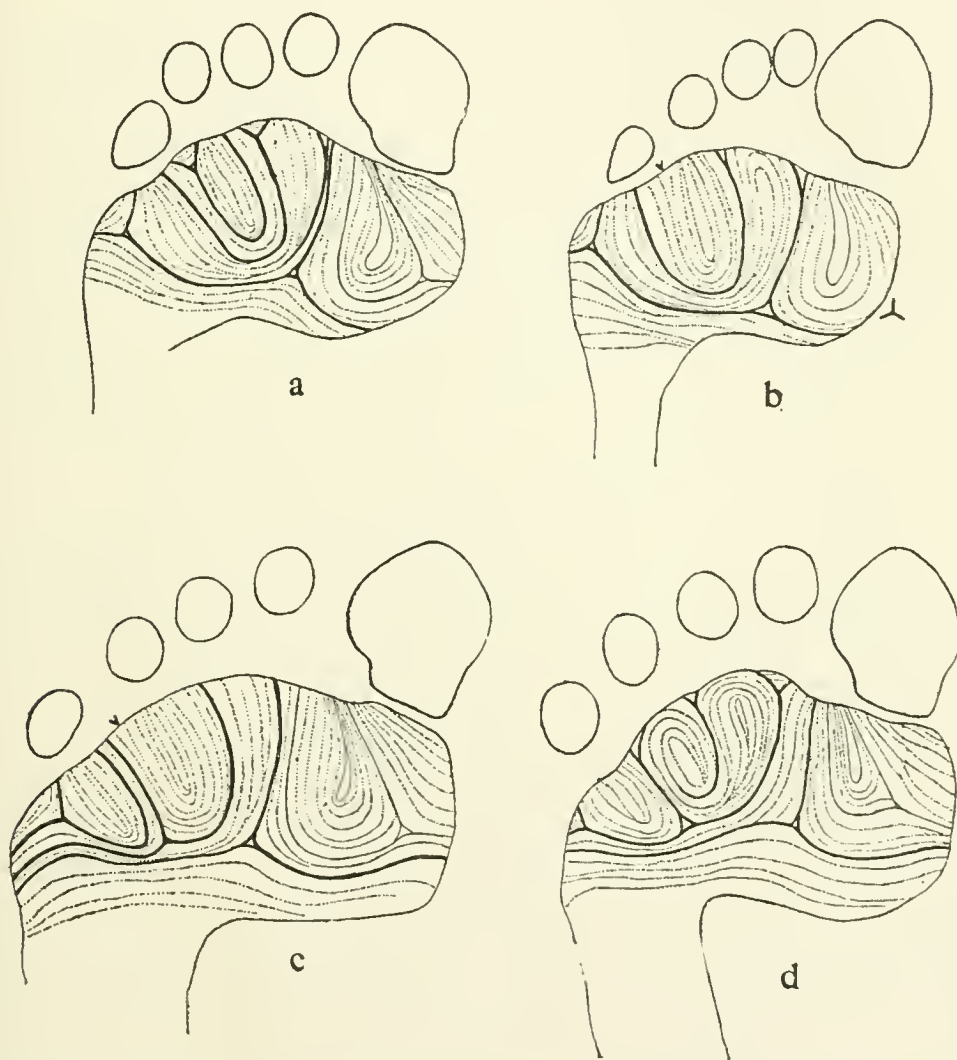


FIG. 5. — Types of Maya sole prints. Two-fifths natural size. Compare with plate XI. (a, Cat. No. 337. b, Cat. No. 348. c, Cat. No. 335. d, Cat. No. 340, right reversed.)

variation found in my collection of 26 (13 individuals; see table 1). That these prints are similar to one another in some general way strikes one at once, but it may take some little time and a further chance for comparison before it is noticed that this similarity is due in great part *to the almost constant presence of a large lower triradius*,

placed below the interval between the great toe and the rest, and possessing two extensive lower radiants which stretch almost horizontally across the sole and entirely exclude from the inner margin the lines and ridges of the three plantar areas. The radiants of this triradius are fairly constant in direction and relation, and are as follows in the various individual cases :

Upper¹ radiant :

Within line A.. .. .	15	instances
Fusing with line A.....	3	“
Without line A.....	3	“

Inner radiant :

Below inner hallucal triradius.....	18	“
Fusing with inner hallucal triradius.....	2	“
Above inner hallucal triradius.....	1	“

Outer radiant :

Below line D	11	“
Fusing with line D	4	“
Above line D.....	6	“

From these statistics the characteristic position and relationships of this lower triradius are ascertained: *the upper radiant passes within line A, thus bringing the entire triradius into close relationship with the hallucal pattern*; the inner and outer radiants form together a nearly horizontal line, extending below both the hallucal pattern on the inside and the origin of line D on the outside, and thus *excluding from the inner margin all the ridges that form a part of any of the plantar areas*. In this effect the four cases in which the outer radiant fuses with line D should be added to the other eleven, making 15 instances in which none of the upper ridges escapes this barrier. In the six cases in which the outer radiant lies above line D, it runs through the middle of the 3d plantar area, and only those few ridges, 8-10 in number, which lie between it and line D, are allowed to escape.

It will be seen from the above that only 21 lower triradii are accounted for out of 26 soles, and this is because five do not

¹ The designations *upper*, *inner*, and *lower*, as used here, are merely topographical, and are the best suited to descriptive use; the true morphological relations cannot in all cases be determined.

possess the character. In four of these, however, the triradius is rudimentary, that is, its position is marked by a convergence of ridges, and in one of these cases they are disposed in such a way as to shut off the inner margin as though a definite triradius were present. *It is a tempting hypothesis to account for such cases as due to the influence of white blood, since an open access to the inner margin and the absence of a retaining triradius form a type especially abundant in the white race, and this may indeed be the truth, owing to the actual admixture of white blood in the present-day Mayas.* It seems impossible, however, to find any character in the exclusive possession of a given race, and even this condition, which may almost be termed the "Maya type," occasionally occurs in every detail in a white. To make a more definite comparison of this point, I selected at random from my collection the sole-prints of 13 individuals of the white race, the results from which, as compared with the Mayas, are as follows :

	<i>Mayas</i> (26 soles)	<i>Whites</i> (26 soles)
"Maya type," i. e., a large lower triradius, excluding the plantar areas from the inner margin.....	21 (81%)	5 (19%)
"White type," i. e., no large lower triradius, the plantar areas opening freely to the inner margin....	8 (30%)	18 (70%)

The recent investigations of Miss Whipple show that there are in the human sole typically four lower triradii, one belonging to the hallucal pattern and one to each of the three plantar patterns ; and that, furthermore, they are brought so near together by the convergence of the four areas in question that in some cases, especially in that of the 1st and 2d (hallucal and 1st plantar) it is impossible to decide to which one a given triradius belongs. A large lower triradius occurring in the white race in approximately the same place as in the Mayas is perhaps best accounted for as a fusion of the two, especially as it occasionally appears partly double ; but *in one important respect the triradius in question differs in the Mayas from its condition as found in the whites, and that is, in the*

almost constant position of its upper radiant inside of line A, and in its consequent close relationship to the hallucal patterns (with certainty in 19 out of 26), thus suggesting that as a rule it is, in the Mayas, not a fusion of \perp_1 and \perp_2 but the former alone ; while it seems in the whites more often to represent either \perp_3 , that is, the lower triradius of the 1st plantar pattern, or a fusion of this with that of the hallucal pattern.

The two remaining lower triradii (\perp_3 and \perp_4) are more definite in position and usually easy to distinguish. The first of these, that of the 2d plantar pattern, appears just below the corresponding area and is usually so arranged that its upper and outer radiants together form a broad loop, enclosing the 2d plantar pattern, while the remaining radiant, the inner one, rises from the center of the aforesaid loop and runs obliquely to the inner margin. This triradius in the above, or typical form, is fairly frequent in the white race, occurring four times in the 26 feet used for comparison, but is not once indicated in the same number of Mayas. The fourth lower triradius, on the other hand, seems to be frequent in the Mayas and rare in the white race. This is the one shown in fig. 5, *d*, and appears, always in connection with more or less definite patterns, between the 2d and 3d plantar areas. In the 26 Mayas 8 instances of this are seen, or about 30 per cent., but in the 26 whites it occurs but once as a complete triradius and is indicated once by a convergence of ridges.

Summing up the results obtained covering the lower triradii of the Mayas, although the material employed is far too scanty for definite results, we have the following :

- (a) A large triradius, approximately beneath the interspace between the hallux and the second toe, is almost universal among the Mayas ; its two lower radiants extend horizontally across the foot in such a way as to exclude the three plantar areas from the inner margin ; its upper radiant is more usually within than without line A, suggesting that its morphological significance is that of the hallucal lower triradius, or \perp_1 . A similar triradius is infrequent among the whites and, when present, appears through its general relationship to be either a fusion of \perp_1 and \perp_2 or the latter alone.
- (b) The lower triradius of the 2d plantar area (\perp_3), not infrequent in the white race, does not appear with certainty in the Mayas.

(c) The lower triradius of the 3d plantar area (\perp_4) is common in the Maya race, but infrequent among the whites.

For the study of plantar areas I have prepared three tables, the first of which, table VIII, gives the formulation of the 26 Maya soles, the second, table IX, a similar formulation of four like sets of whites, 26 each; and in the third, table X, there are given the actual occurrence and the percentage of each type of pattern both in the sole as a whole and in the separate plantar areas in whites and Mayas. By means of table IX the important point is established that *the number 26 is sufficient to give the characters of a race with approximate correctness, since the figures of the four sets, A-D,*

TABLE VIII.—Sole Formulæ of 13 Mayas.

No.	LEFT SOLE.	RIGHT SOLE.
333	A · O · 5 · Cl	A · 5 · Cl ^v · Cl
334	A · 5 · Cl · Cl	A · 5 · Cl · Cl
335	A · Cl · Cl · Cl	A · 5 · Cl · Cl
337	A · +3 · Cl+3 · +1+2	A · +3L · Cl · +1O
338	W · +3 · Cl · +1O	AB · +2+3 · Cl · +1O
341	A · +3 · Cl · +1O	W · O · Cl ^v · O
340	A · +3L · ClL · +1	A · +2L · +1ClL · Cl
345	A · O · O · O H	A · 5 · 5 ^v · Cl · H
346	A · Cl ^v · O · O	B · ClOL · O · O
347	A · 5 · Cl · Cl	A · 5 · Cl · Cl
348	A · +3L · Cl · +1	A · +3L · Cl · +1O
349	A · Cl ⁱ · Cl+1 · O	A · +3 · Cl · +1O
350	A · +3 · Cl · +1	W · +35 · Cl · +1

NOTE.—The W patterns are all typical whorls, with cores formed of concentric circles, and with three triradii.

are in the main not very different from one another or from the general average, a principle the establishment of which allows us to draw conclusions from the small number of Maya prints with some little confidence. It must be acknowledged, however, that while in the 52 whites represented there are no cases of blood relationship so far as I can ascertain, several of the Mayas are thus related, as given in table I, and that, consequently, certain of the characters considered racial may be merely those of a family. Thus in the oft recurring formula of table VIII, A·5·Cl·Cl, four out of the six cases belong to the brothers “Can,” Nos. 333–335, and thus invalidate the conclusion that the formula in question is a racial character.

In comparing the Maya formulæ with those of the whites, tables VIII and IX, the most apparent difference is *the large number of open areas in the former and of the closed areas in the latter*, differences which are well shown in table X, where the average of the four white sets may be compared with the single Maya set. Out of the 78 possible patterns in each case (26×3), 49 of them, or 62.8 per cent., are open in the whites, and but 18, or 23 per cent. in the Mayas; while if the closed patterns be similarly compared, there are on an average not quite 25 out of 78 in the whites, as contrasted with 35 in the Mayas, or 31.7 per cent. to 44.8 per cent.

The next comparison, that of the occurrence of confluent, or partly confluent, areas, shows *nearly three times as many cases in the Mayas as in the whites*, or 13 per cent. against 34.6 per cent. Areas exhibiting the phenomenon of upper loops are of practically equal occurrence in each race, 10.9 per cent. vs. 10.2 per cent., but *in the computation of areas which open outward, the Mayas show 12.8 per cent. against 1.3 per cent. in the whites; that is, a fair proportion of occurrence against one that is a great rarity*. This is plainly correlated with the almost constant occurrence in the Mayas of a large lower triradius, stretching with its radiants across the sole and cutting off the inner margin, thereby directing the ridges of the first two areas, and of area 1 especially, toward area 3 and the outer margin. Nearly all of these instances are those of area 1, which fails wholly or in part to rise high enough to come within line D and the 4th digital triradius.

Comparing the separate plantar areas by themselves we note the following (table X, lower half, two right-hand columns):

Area 3 is in both races more apt to be open than are the others, and area 2 is more frequently closed. An open area 3 occurs in 83.6 per cent. of the whites, and a closed area 2 in 80.7 per cent. of the Mayas. The most common fusions are those between areas 1 and 3, 2 being seldom involved. An area with an upper loop is rare, except in area 1, where it is fairly common in both races (20-23 per cent.). The opening outward of an area (position 5) seems never to be possible for area 3, and in the white race is rare for the other two areas; in the Mayas it occurs occasionally in the case of area 2, and in area 1 is so common (30 per cent.), in correlation with the large lower triradius, that it may be considered a race character.

The hallucal pattern is overwhelmingly of one type, *A*, the one the core of which opens upward to the interval between hallux and digit II (80.8 per cent.). Nowhere near so great a proportionate occurrence of this type occurs among any of the other races examined, and in the whites, where it seems to be quite characteristic, the actual occurrence is but 49 per cent. In the Mayas the outer triradius, i. e., the one between it and area 1, is usually preserved, but is generally absent in the whites. Practically the only other pattern that occurs is the whorl, which appears in its most primitive form, with three triradii and with a core of concentric circles.

Summary of Maya Sole Characteristics.

- (a) *Plantar areas (as a whole)*: Usually excluded from the inner margin by means of the radiants of a large lower triradius between hallucal and first plantar area. In correlation with this, areas 1 and 3 become confluent in a broad sweeping curve, enclosing area 2.
- (b) *Plantar areas (separately)*: Area 1 confluent with area 3, either completely or with some of the ridges of area 1 separated by line D, and thus forced to open at the outer margin. Area 2 a broad loop surrounded by the U-shaped ridges of the confluent areas 1 and 3, thus making it a closed area. Area 3 either confluent with area 1 or with a lower triradius which embraces a part of its ridges, making it partially closed.
- (c) *Hallucal pattern*: Usually the *A* type, with outer triradius (i. e., the one between it and plantar area 1) persistent (19 out of 26). Aside from this there sometimes occurs the primitive whorl (*W*) with a core of concentric circles and with all three triradii present.
- (d) *Hypothenar and Calcar patterns*: The hypothenar seems to occur but rarely. The calcar has not been observed.
- (e) *Maya formula*:¹ As composed from the most frequent symbol for each position, the characteristic Maya sole formula would be the following:

$$A \cdot + 3 \cdot Cl \cdot + 1$$

¹ The attempt to establish a racial formula by uniting the most characteristic symbols for each part designated seems in general hardly warrantable, since the resulting combination seldom if ever occurs. Thus I have given up the attempt in most cases, e. g., Maya palms. Here, however, the similarities are so great and certain characters so constant in their occurrence that I let it stand as an experiment.

Other common or, at least, characteristic conditions are for area 1 (5); and for area 3 the escape of a part of its lower ridges by the inner margin (+ 1, O), also its closure by means of a third lower triradius (Cl.). This would give, as other common formulæ, closely related to the above,

$$A \cdot 5 \cdot Cl \cdot + 1O$$

$$A \cdot 5 \cdot Cl \cdot Cl$$

Although in 26 Maya soles the first of these occurs 8 times, and the third 6 times, 14 in all, or, if we include two with a W hallucal pattern, 16, i. e., 71 + per cent., in 104 white soles they occur but 5 times, or, with the same latitude as to hallucal patterns, 9 times (7 per cent.). As to characteristic white formulæ, the commonest is the simple $A \cdot O \cdot O \cdot O \cdot$, which occurs, with latitude as regards type of hallucal pattern and with a few other slight modifications, 39 times in the 104 soles, or 37.5 per cent. Still cases occur in both races which might well belong to the other; thus, No. 60 of series A, table IX, might well be a Maya, save for the spiral core to the hallucal pattern, and Nos. 345 and 346 of table VIII might be white. As a matter of fact there is white blood in No. 345, and perhaps in 346, but who shall say that the Maya-like formulæ of certain whites denote aboriginal ancestry? Even this is, of course, possible, but in view of the occasional similarity in individual cases in all the races thus far examined, such a conclusion is neither likely nor necessary.¹

B. — AMERICAN NEGROES

Material. — My Negro material is a little more extensive than is that from the Mayas, and is wholly due to the kindness of my assistant, Miss Whipple, who personally collected the entire set, in great part from two institutions in Providence, R. I., the Shelter for Colored Children, and the Home for Aged Colored Women. Miss Whipple received much kindness and assistance from the matrons

¹ In this connection it may be interesting to note that in both soles of the woman mummy of the "Basket-people," the restoration of which has been recently described by me (*Amer. Anthropologist*, 1904, vol. VI, pp. 1-17), the formula was the simple $A \cdot O \cdot O \cdot O \cdot$, in one case with a well-formed hypothenar loop. The right hand, also, showed an extensive hypothenar pattern of the loop type. The main line formula was 11·8·7·5·C; also more like the whites than the Mayas.

and other officials of those institutions, help that has contributed in no small degree to the completion of this paper.

The following table will show the material employed and the relationship and purity of race of the individuals involved :

TABLE XI.—*List of Prints used in the Study of the American Negroes.*¹

CAT. No.	SEX.	NAME OR DESIGNATION.	RELATIONSHIP, RACE, ETC.
124	♀	Mrs Thomas	
125	♀	Bessie	Daughter of 124
126	♀	A. C. W. No. 1	Inmate, A. C. W.
128	♀	A. C. W. No. 3	$\frac{1}{4}$ to $\frac{1}{2}$ Negro, inmate, A. C. W.
129	♀	A. C. W. No. 4	Matron, Home for A. C. W.
130	♀	A. C. W. No. 5	Aunt of 129, inmate, A. C. W.
166	♀	Viola Jackson	Sister of 167 and 168
167	♂	Arthur Jackson	Brother of 166 and 168
168	♂	George Jackson	Brother of 166 and 167
169	♂	Oswald	Brother of 170
170	♀	Louise	Sister of 169
171	♂	Andrew	Brother of 172
172	♀	Hope	Sister of 171
173	♀	Alice	Sister of 174
174	♀	Mary	Sister of 173
175	♀	Ethel	Sister of 176
176	♀	Lulu	Sister of 175, light color
177	♀	Leola	Very black
178	♂	John	
179	♂	Joseph	
180	♂	Eddie	"Possibly some white blood"
181	♂	Martin	Father Irish, mother nearly white
182	♂	Clarence	Very black
365	♀	Maggie Logan	Nurse maid

Palms. — The study of the palm prints of the above 24 individuals yielded the results expressed in table XII, in which are given the main line, the carpal, and the pattern formulæ.

Of main-line formulæ, which are arranged in numerical order in table XIII, there are 24 varieties, although the first, 6·5·5·3', is practically a 7·5·5·3', in which the loop is reduced in zero, thus rendering line D entirely obsolete ; and in the single instance of 7·9·5·11', the fourth term is almost a 5 with an intervening triradius.

From this table it will readily be seen that *the lower formulæ, or those in which the first two terms are below 10.6, are more marked than in the Maya race. Thus in the whites 98 out of 200 formulæ, i. e., 49 per cent., were below this point ; the Maya showed 28 out of 42,*

¹ Collected by Miss Inez Whipple. All are complete sets (palms and soles) except No. 125, with palms alone.

TABLE XII.—*Main Line, Carpal, and Pattern Formulæ of 48 Negro Hands.*

CAT. NO.	MAIN LINE AND CARPAL FORMULÆ—LEFT.	MAIN LINE AND CARPAL FORMULÆ—RIGHT.	PATTERN FORMULÆ—LEFT.	PATTERN FORMULÆ—RIGHT.
124	7 · 5 · 5 · 3 · Co	7 · 5 · 5 · 3 · Co	0 · 0 · 0 · 0 · 3 ¹	0 · 0 · 0 · 0 · 3 ¹
125	7 · 5 · 5 · 5 · P	7 · 5 · 5 · 5 · C ^c	0 · θ · 0 · 0 · 3 ¹	H · 0 · 0 · 0 · 3 ¹
126	7 · 5 · 5 · 3 · C ^c	8 · 6 · 5 · 5 · C ^c	0 · 0 · 0 · 0 · 3 ¹	0 · 0 · 0 · 0 · 3 ¹
128	11 · 10 · 8 · 5 · C ^c	9 · 9 · 5 · 5 · C ^c	0 · 0 · 0 · 0 · 2 ¹ · 0	0 · 0 · 0 · 0 · 2 ¹ · 0
129	6 · 5 · 5 · 3 · Co	8 · 6 · 5 · 5 · Co	0 · 0 · 0 · 0 · 0 · 0	0 · 0 · 0 · 0 · 0 · 3 ¹
130	7 · 5 · 5 · 5 · Ch ^o	7 · 5 · 5 · 5 · Ch ^o	0 · 0 · 0 · 0 · 0 · 3 ¹	0 · 0 · 0 · 0 · 0 · 3 ¹
166	7 · 7 · 5 · 5 · Ch	11 · 9 · 7 · 5 · Ch	0 · θ · 0 · 0 · 2 ¹ · 3 ^t	0 · θ · 0 · 0 · 2 ¹ · 3 ^t
167	9 · 7 · 5 · 5 · Co	9 · 7 · 5 · 5 · Co	0 · 0 · 0 · 0 · 0 · 3 ¹	0 · 0 · 0 · 0 · 0 · 3 ¹
168	10 ^t · 9 · 6 · 5 · C ^c	7 · 9 · 7 · 5 · C ^c	H ^r · 0 · 0 · 0 · 2 ¹ · 3 ^t	0 · 0 · 0 · 0 · 2 ¹ · 3 ^t
169	9 · 9 · 5 · 5 · Ch	11 · 9 · 7 · 5 ^t · Co	0 · 0 · 0 · 0 · 2 ¹ · 3 ^{tr}	0 · 0 · 1 ^{tr} · 0 · 2 ¹ · 0
170	9 · 7 · 5 · 5 · C ^c	9 · 7 · 5 · 3 · Co	H · 0 · 0 · 0 · 0 · 3 ¹	H · 0 · 0 · 0 · 0 · 0
171	9 · 8 · 5 · 5 · Co	9 · 7 · 5 · 5 · Co	0 · 0 · 0 · 0 · 0 · 0	0 · 0 · 0 · 0 · 0 · 3 ¹
172	9 · 7 · 5 · 1 · Co	9 · 7 · 5 · 2 ³ · Co	0 · 0 · 0 · 0 · 0 · 3 ¹	0 · 0 · 0 · 0 · 0 · 3 ¹
173	7 · 9 · 5 · 5 · Ch	11 ^t · 9 · 7 · 5 ^t · Ch ^o	0 · θ · 0 · 0 · 2 ¹ · 3 ^t	0 · θ · 0 · 0 · 2 ¹ · 3 ^t
174	7 · 8 · 5 · 3 · P	11 ^t · 9 · 7 · 5 · C ^c	0 · θ · 0 · 0 · 0 · 3 ^t	0 · θ · 0 · 0 · 2 ¹ · 3 ^t
175	7 · 7 · 5 · 5 · C ^c	7 · 9 · 7 · 5 · C ^c	0 · 0 · 0 · 0 · 0 · 3 ^t	0 · 0 · 0 · 0 · 2 ¹ · 3 ^t
176	7 · 5 · 5 · 5 · P	8 · 6 · 5 · 5 · P	0 · 0 · 0 · 0 · 0 · 3 ^{3t}	H · 0 · 0 · 0 · 0 · 3 ¹
177	11 · 9 · 7 · 5 · P	9 · 7 · 5 · 5 · C ^c	H · 0 · 0 · 0 · 2 ¹ · 3 ^t	0 · 0 · 0 · 0 · 0 · 3 ¹
178	7 · 5 · 5 · 2 · P	8 · 6 · 5 · 3 · C ^c	0 · 0 · 0 · 0 · 0 · 3 ^t	0 · 0 · 0 · 0 · 0 · 3 ¹
179	7 · 9 · 5 ^t · 11 ^{5t} · C ^c	11 ^t · 9 · 7 · 5 ^t · C ^c	0 · θ · 1 ^t · 0 · 2 ¹ · 3 ^t	0 · θ · 1 ^t · 0 · 2 ¹ · 3 ^t
180	7 · 7 · 5 · 5 · C ^c	11 · 9 · 7 · 5 · C ^c	0 · 0 · 0 · 0 · 0 · 3 ^{1t}	0 · 0 · 0 · 0 · 2 ¹ · 0
181	7 · 5 · 5 · 1 · C ^c	7 · 5 · 5 · 3 · C ^c	H · 0 · 0 · 0 · 0 · 3 ¹	0 · 0 · 0 · 0 · 0 · 3 ¹
182	7 ⁸ · 5 ⁶ · 5 · 3 · C ^c	9 · 7 · 5 · 5 · C ^c	0 · 0 · 0 · 0 · 0 · 3 ¹	0 · 0 · 0 · 0 · 0 · 3 ¹
365	10 · 8 · 6 · 3 · P	11 · 8 · 7 · 5 · Co	0 · 0 · 0 · 0 · 0 · 0	0 · 0 · 0 · 0 · 0 · 0

NOTE.—The numerical exponents signify possible alternative interpretation. *t* signifies a lower triradius, either in the course of a line or occurring in the formation of a pattern. *r* means that a pattern is rudimentary.

or 66⅔ per cent., while in this set of Negroes there are 37 out of 48, or 77 per cent. It would be of great value could the proportions quoted here be found to obtain universally among these races, and in spite of the small number of individuals from which these statistics are deduced, since they seem to rest upon so general a set of characters, and since the difference of percentage is so considerable, I am inclined to think that some such relation will be found to obtain in general. The establishment of such a point, however, demands the compilation of data from many hundreds, if not thousands, of individuals known to be of pure blood, and in this first paper upon the subject the main object is to inquire *whether distinct racial differences do exist, rather than to attempt to establish them upon such scanty data.* Regarding the relative tendency to vary in the two hands, it seems that here, as in the other races dealt with, the left is considerably more variable than the right. In these 24 different formulæ

13 are found in left-hands alone and 6 in the rights alone, while 5 are common to both. In 20 Maya formulæ 10 were found in the lefts alone, 6 in rights alone, while 4 were common; and in 62 white formulæ the figures are 23 for the lefts alone, 14 for rights alone, and 25 for both.

TABLE XIII.—*Occurrence of Main Line Formulæ in Negro Hands.*

FORMULÆ.	L.	R.	BOTH.	FORMULÆ.	L.	R.	BOTH.
6·5·5·3	1	0	1	9·7·5·2	0	1	1
7·5·5·1	1	0	1	9·7·5·3	0	1	1
7·5·5·2	1	0	1	9·7·5· $\frac{4}{5}$	1	0	1
7·5·5·3	3	2	5	9·7·5·5	1	4	5
7·5·5·5	3	2	5	9·8·5·5	1	0	1
7·7·5·5	3	0	3	9·9·5·5	1	1	2
7·8·5·3	1	0	1	10·8·6·3	1	0	1
7·9·5·5	1	0	1	10·9·6·5	1	0	1
7·9·5·11 ⁵	1	0	1	11·8·7·5	0	1	1
7·9·7·5	0	2	2	11·9·7·5	1	6	7
8·6·5·3	0	1	1	11·10·8·5	1	0	1
8·6·5·5	0	3	3				
9·7·5·1	1	0	1	Totals.	24	24	48

Formulæ occurring in lefts alone, 13. Formulæ occurring in rights alone, 6. Formulæ common to both, 5.

The abnormally large proportion of occurrence in the right hand of the highest formula, 11·9·7·5, seen in both whites and Mayas, occurs here also, and in fact in so nearly the same proportion in all as to indicate strongly the presence of a general law. Thus in 24 right palms this formula occurs 6 times, or exactly 25 per cent., and in left-hands but once, or approximately 4 per cent. For 200 palms of the white race the corresponding figures are: rights 22 per cent., lefts 4 per cent.; and for 42 Maya palms, 25 per cent. and 0. In this vastly greater success of the right hand to perfect what has been shown to be in man the position of greatest physiological advantage for the friction ridges (Miss Whipple, 1904), we are forcibly reminded of the doctrine of USE-INHERITANCE, since all the races under discussion are right-handed, and since the degree of success attained is in all cases practically the same. This is but one of numerous instances that are constantly coming up in the investigation of friction ridge configuration, all suggesting the great applicability of this study for the solution of questions of general biological interest.

The results of the consideration of the separate main lines and their terminations are given in table XIV, easily deducible from tables XII and XIII, but arranged in a more convenient form for reference :

TABLE XIV — *Frequency of Occurrence of the Various Terminal Positions, with Percentages (Negroes).*

TERMINI	LINE D				LINE C			
	L	R	Both	% (both)	L	R	Both	% (both)
1	—	—	—		—	—	—	
2	—	—	—		—	—	—	
3	—	—	—		—	—	—	
4	—	—	—		—	—	—	
5	—	—	—		9	4	13	27+
6	1	—	1	2+	—	4	4	8.3+
7	14	6	20	41.5+	6	6	12	25
8	—	4	4	8.3+	3	1	4	8.3
9	5	7	12	25	5	9	14	29+
10	2	—	2	4+	1	—	1	2+
11	2	7	9	19—	—	—	—	

TERMINI	LINE B				LINE A			
	L	R	Both	% (both)	L	R	Both	% (both)
1	—	—	—		2	—	2	4+
2	—	—	—		1	1	2	4+
3	—	—	—		6	4	10	21—
4	—	—	—		1	—	1	2+
5	20	15	35	73—	13	19	32	66.6+
6	2	—	2	4+	—	—	—	
7	1	9	10	21—	—	—	—	
8	1	—	1	2+	—	—	—	
9	—	—	—		—	—	—	
10	—	—	—		—	—	—	
11	—	—	—		1	—	1	2+

Table xv gives a comparison of the final results with those obtained from Mayas and whites (see also table v, and table II in appendix), and is thus the most important of the three in pointing out the amount of racial difference, and the extent to which one can use the main lines and their termini as ethnological criteria.

From this we may deduce the following results, which are to be considered the final results of the present paper in regard to main lines, since the prints of Chinese and other races which I possess are too few to present in tabular form :

Line D: The position (7) for this line is a marked Negro characteristic, especially as compared with the white race ; over 41 per cent., as compared with 11 per cent. For the latter race the

higher positions are especially characteristic, positions (10) and (11) together receiving more than half, as contrasted with 23 per cent. in the Negroes. The characteristic Maya position is (9), 36 per cent., as contrasted with 25 per cent. in both whites and Negroes. Position (10) is very unusual in Negroes, and position (11) in both Negroes and Mayas is about half as common as in whites.

TABLE XV.—Comparison of the Main Line Positions in Tables V and XIV.

TERMINI	LINE D			LINE C		
	Maya	White	Negro	Maya	White	Negro
1	—	—		—	—	
2	—	—		—	—	
3	—	—		—	—	
4	—	—		—	—	
5	—	—		24—	8.5	27+
6	—	—	2+	7+	11.5	8.3
7	24—	11	41.5+	14+	33	25
8	7+	12	8.3+	19+	15	8.3
9	36—	25.5	25	36+	26.5	29+
10	19+	13.5	4+	—	5	2+
11	14+	38	19—	—	.5	

TERMINI	LINE B			LINE A		
	Maya	White	Negro	Maya	White	Negro
1	—	—		16+	1	4+
2	—	.5		9+	9.5	4+
3	—	—		21+	20.5	21—
4	—	—		—	10	2+
5	66+	47	73—	50	58	66.6+
6	19+	13.5	4+	—	—	
7	14+	33.5	21—	—	—	
8	—	5	2+	—	—	
9	—	.5		—	—	
10	—	—		—	—	
11	—	—		2+	1	2+

Line C: Position (5) is a little more common in Negroes than in Mayas, and in both is more than three times as common as in the white race, in which it occurs but seldom. For this latter race, position (7) is the most frequent, and is less than half as common in the Mayas, while the Negroes stand in this particular intermediate between the two. Position (9) has been given as the Maya characteristic, but is also quite common in the other races. A complete suppression of the line seldom occurs in the Negro (8.3 per cent.), but is about twice as frequent in both Mayas and whites, the Mayas leading by a little.

Line B: In all these races the most usual position is (5), but here the Negro has the decided lead. In fact this position accounts for three-fourths of the cases, and position (7) the remaining fourth. Position (6), that is, a fusion with line D, is quite common in the Mayas, about one-fifth of the cases, while in the white race position (7) claims one-third.

Line A: In Negroes a low position is not especially common, much less, indeed, than in whites, as the latter show 41 per cent. below (5) and the former but 31 per cent. For the same positions the Maya percentage is 46, — not very different from the whites, save in the important respect that in the Mayas a large part of these low positions are (1), i. e., before the carpal triradius. Thus the true conditions in these races are better seen by comparing the total percentage of positions (1) and (2), which are in Mayas 25 per cent., in whites 10.5 per cent., and in Negroes but 8 per cent. The Negroes in this respect are actually higher than the whites, and far ahead of the Mayas. In the Negro, then, position (5) is emphatically the most characteristic.

In my first attempt at looking for racial differences the material I used was that of the Negro prints Nos. 124–129, in which, as an inspection of table XIII will show, almost every formula was either 7·5·5·5; or else one easily derived from it. This I set down at once as the Negro formula, and although my later studies have necessitated a modification of my first views as to its universality, *I still think it may be typical and would like to consider that any great aberrancy from it is due to the influence of other blood.* Whether this will be borne out by later facts or not, no one can say, but the investigation of a large number, at least 100, of the prints of the natives of the Guinea coast, collected in Africa and not too near Liberia or any white settlement, might corroborate it.

It will appear at once that any near approach to one another of lines C and D would admit of three varieties: (1) where C is below D, (2) where they meet, and (3) where C passes above D; or 7·5·, 8·6·, and 9·7·, respectively, and thus these three forms would be practically the same. Again, the figure for line A might be 4, 3, or even 2 without practically modifying the several interrelationships, and thus the typical formula would admit of at least the following varieties:

7· 5· 5· 5·
 7· 5· 5· 3·
 7· 5· 5· 2·
 8· 6· 5· 5·
 8· 6· 5· 3·
 8· 6· 5· 2·
 9· 7· 5· 5·
 9· 7· 5· 3·
 9· 7· 5· 2·

These present a different aspect when written, but might be hardly distinguishable from one another in an actual print. In the 48 Negro hands under inspection these formulæ represent 27 of them, or 56.2 per cent., while in the 42 Mayas (not admitting any case of position 1 for line A) there are 15, or 35.6 per cent., and in 200 whites, making the same reservation, yet admitting such a form as 7·5·3·2·, 7·5·5·4·, etc., there are 73, or 36.5 per cent. This large occurrence in the Negroes (56.2 per cent.) as contrasted with the 35.6 per cent. and 36.5 per cent. of the other two races makes the hypothesis advanced above appear rather probable. Further investigation in this direction will be awaited with great interest.

In the carpal region a parting instead of a triradius is met with 7 times in the 48 hands, or 14.6 per cent., about as in the Mayas and much less than in the whites. The two most characteristic forms of triradius are the centrally placed one, 43.8 per cent., and the one situated near the outer margin, $33\frac{1}{3}$ per cent., both with quite a little carpal area below them. The very low position so common in Mayas does not seem to occur.

The pattern formulæ given in table XII furnish the data used in table XVI, which gives the occurrence of each type of pattern in each hand, and the percentage in each case, as well as the percentages of Mayas and whites copied from table VII for ease of comparison. From this it will be seen that *both hypothenar and thenar patterns are of infrequent occurrence, this loss being more than made up by the almost universality of one or the other type of pattern on the 3d palmar area.* The percentage of occurrence of a loop pattern on the second area, caused by a recurving of line C to the inner side, is singularly constant in all three races, $33\frac{1}{3}$, 34, and 37 per cent., respectively.

TABLE XVI.—*Occurrence of Patterns in Palm (Negroes) with Comparison of Mayas and Whites.*

DESIGNATION OF PATTERN.	NEGRO (48).				MAYA (44).	WHITE (100).
	L.	R.	Both.	%	%	%
Hypothenar	4	3	7	14.6	4.5	41
Thenar (up and down)	5	4	9	18.7	50	7
1 (triradius)	1	2	3	6.2	4.5	2
2 (triradius)	0	0	0	0	0	1
2 (loop)	7	9	16	33.3	34	37
3 (triradius)	9	8	17	35.4	29.5	15
3 (loop)	13	13	26	54.1	29.5	44
Total. ¹	39	39	78	222.3	152	147

¹ Here, as in table VII, the totals have little value, but serve to show the relative occurrence of patterns in the various races.

In the third area the false or loop pattern is much commoner than the true one formed by means of a triradius, as is also true in the white race, but in the Mayas the two are exactly equal in occurrence. The total number of Negro hands on which the third area has a pattern is not quite 89.5 per cent., the number obtained by adding the percentage of occurrence of each type as given above, since in a few cases both types appear simultaneously, but the percentage is not far out of the way and may be safely quoted at 85 per cent., as contrasted with 59 per cent. in both Mayas and whites, *thus establishing it as a Negro characteristic.*

Summary of Negro Palm Characteristics.

- (a) *Main lines*: An overwhelming percentage of occurrence of the lower formulæ, but without the especially low position of line A, characteristic of the Mayas. The commonest formulæ are 7.5.5.5., 8.6.5.5., and 9.7.5.5., and various slight modifications of them, representing 56.2 per cent. of the 42 cases investigated, while in both Mayas and whites the proportion is 35–36 per cent. Correspondingly the higher formulæ (those beyond 10.6) are conspicuous for their infrequency. (Cf. table XIII with table I of the appendix.)
- (b) *Carpal area*: A triradius is almost constant, about as in the Mayas, the two most characteristic forms being the central and lateral. A well-defined carpal area is usually present, and the very low position of the triradius, rendering the area obsolete, so common in the Mayas, is of infrequent occurrence.

(c) *Patterns*: Correlated with the occurrence of the lower formulæ a loop pattern on area 3 is very common, since position (7) for lines D or C, or the fusion of the two, would produce it. Since, as it happens, a genuine (triradius) pattern occurs on the same area in more than a third of the cases, sometimes indeed side by side with a false or loop pattern, it results that area 3 is seldom without one or the other type (85-90 per cent.). This brings the total of pattern occurrences far beyond that in the other races examined, although, as a matter of fact, the other patterns are considerably less frequent than in the whites or Mayas. Hypothenar and thenar are of about equal occurrence, but the former is but a third as frequent as in the whites, and the latter less than two-fifths as frequent as in the Mayas.

Soles. — As material for this investigation I have sole prints of all the Negroes given in table XI, with the exception of No. 125, making a total of 23 individuals. Of these the sole characters are shown by means of descriptive formulæ in table XVII from which the actual occurrence of each character, with their percentage values, may be easily deduced.

TABLE XVII.—*Sole Formulæ of 23 American Negroes.*

CAT. NO.	SOLE FORMULA—LEFT					SOLE FORMULA—RIGHT				
124	B	.5+3	.Cl	.+1	.—	W ^{bs}	.+3	.Cl	.+1	.—
126	W ^d	.OL	.O	.Cl ^t	.—	W	.O	.O	.Cl ^t	.—
128	BC	.+3	.Cl	.+1O	.H	BC	.Cl	.13	.O	.H
129	BC	.+3	.Cl	.+1O	.—	BC	.+3	.Cl	.+1O	.—
130	W ^{bds}	.O	.Cl ^t	.Cl ^t	.H	W ^{bds}	.Cl ^p	.5	.Cl	.H
166	W ^d	.O	.O	.O	.H	W ^{acs}	.O	.O	.O	.—
167	W ^{ds}	.+3	.Cl+3	.+1	.H	A	.+3	.Cl	.+1	.—
168	W	.O ⁿ L	.Cl	.Cl ^t	.—	W	.5	.Cl ^t	.Cl	.—
169	A	.O ⁿ	.Cl ^v	.O	.H	A	.O	.O	.O	.—
170	AC	.O	.O	.O ^v	.—	AC	.O ⁿ	.O	.Cl ^t	.H ^r
171	W ^d	.OL	.OClt	.O	.H	W ^d	.OClt	.Cl ^t	.O	.H
172	W ^{es}	.O	.Cl ^v	.O	.H	W ^d	.O	.O ^v	.O	.—
173	W ^{bds}	.O	.Cl ^t	.Cl ^t	.H	W ^{bds}	.O ⁿ	.O ⁿ	.O	.H
174	W ^{bds}	.O	.O ⁿ	.O	.—	W ^{bd}	.O	.O ⁿ	.O	.—
175	BC	.+3	.Cl	.+1	.H	BC	.+3	.Cl	.+1	.—
176	B	.O	.Cl ^t	.O	.H	B	.+2	.Cl+1	.O	.H
177	B sm	.Cl ^p	.Cl	.Cl5	.—	B sm	.Cl ^p	.Cl	.Cl5	.—
178	W ^{es}	.OL	.O	.O	.H	A	.OL	.O	.O	.H
179	B sm	.5L	.Cl+3L	.Cl ^p +2	.H	B sm	.+3L	.Cl	.+1	.H
180	B sm	.+3L	.+3ClL	.+1	.—	B ^{wsm}	.Cl ^p L	.ClL	.O	.—
181	A	.O	.O	.O	.—	A	.O	.O	.O	.H
182	W ^d	.OL	.O ^v	.O ⁿ	.H ^r	B ^w	.O+3	.Cl	.+1O	.H ^r
365	W ^{dsp}	.O	.O	.O	.—	W ^{dsp}	.O	.O ^v	.O	.—

TABLE XVIII.—*Showing the Occurrence of Special Characters in the Soles of Table XVII.*

Characters	ACTUAL FIGURES				PERCENTAGES ¹			
	Area 1	Area 2	Area 3	Total	Area 1	Area 2	Area 3	Total
Open areas [O]	27	19	27	73	58.7	41.3	58.7	52.9
Closed areas [Cl]	6	26	11	43	13.1	56.5	23.8	31.1
Confluent areas [+]	13	4	13	30	28.3	8.7	28.3	21.7
Upper loop [L]	10	3	0	13	21.7	6.51	0	9.4
Open outward [5]	3	1	2	6	6.51	2.17	4.34	4.34

From a comparison of this table with table x, in which are collected the corresponding data from whites and Mayas, there may be deduced the following facts, more or less important as Negro characters :

The proportion of open areas, 52.9 per cent., lies between the 62.8 per cent. of the whites and the 23 per cent. of the Mayas ; and that of the closed areas is the same as in the whites (31.1 vs. 31.7 per cent.). The figures for the separate areas show that in the Negroes areas 1 and 3 are equally apt to be open, while in whites and Mayas area 3 shows a much stronger tendency in this direction than area 1. As in the other races, area 2 is the most often closed, the tendency being almost that of the whites (56.5 vs. 55.7 per cent.). The tendency toward the fusion of areas is intermediate between Mayas and whites, the three sets of percentages of Mayas, Negroes, and whites respectively being 34.6, 21.7, and 12.8 per cent. As in the other cases, areas 1 and 3 are usually the ones that fuse. The figures for the occurrence of an upper loop are in close accord with those of the other races, and seem to emphasize a general human tendency beyond the influence of race. Areas that open outward are a little more frequent than in the white race, but not nearly so common as in the Mayas, doubtless owing to the infrequency of the large lower triradius, characteristic of the Mayas.

The deductions thus far are of a negative character, and do not serve to point out any trait especially distinctive of the Negro race. The tendency to the approximation of, or in numerous instances the almost complete identity with, the proportions of the whites, may suggest the almost universal admixture of blood, not only ad-

¹ For the separate areas the percentages are calculated on a basis of 46, the number of soles ; for the totals the basis is 138, the number of areas (46×3).

mitted as a general fact, but shown by unmistakable bodily characteristics in many of the individuals under present examination. What might be the results from prints taken from the native race in Africa can be only surmised, but the results thus far render such an investigation of great importance.

A far more hopeful set of characters, in which positive results may be obtained, is that of the hallucal pattern. Remembering the statistics concerning Mayas and whites, especially the almost universal occurrence of the A type in the former and the moderate frequency of the W type in the latter, it is of much interest to note the following comparison of statistics :

TABLE XIX.—*Comparison of Hallucal Patterns in Negroes, Mayas, and Whites.*

TYPE .	ACTUAL FIGURES			PERCENTAGES ¹		
	Negro	Maya	White	Negro	Maya	White
W	22	3	38	47.8	11.5	38
A	6	21	49	13.1	80.7	49
B	10	1	10	21.7	3.8	10
C	0	0	1	0	0	1
AC	2	0	1	4.34	0	1
BC	6	0	1	13.1	0	1
AB	0	1	0	0	3.8	0

Here will be seen in the Negroes two positive characters and one negative one, namely, the high percentage of occurrence of the W and B types, and the subordinate position held by type A. The first of these characters, the dominance of type W, shows considerable increase over the white race, where this character is quite conspicuous, and between the Negroes and the Mayas the difference is a marked one. Besides that of the percentage of occurrence, type W differs in the three races in another way, and that is by its triradii and the formation of its cores. In the Mayas this type, when it occurs, is in its most primitive condition, with three triradii and with a core of concentric circles, while in both whites and Negroes, the outer triradius, i. e., the one between hallux and digit II, has usually disappeared (= exponent *d*). The core of the pattern in the whites is most frequently a spiral (27 out of 38); in the Mayas the primitive con-

¹ In calculating the percentages it must be remembered that the observations are based on 46 Negro and 26 Maya soles. For the whites 100 soles were taken from table IX, rejecting the last four—Nos. 236 and 237.

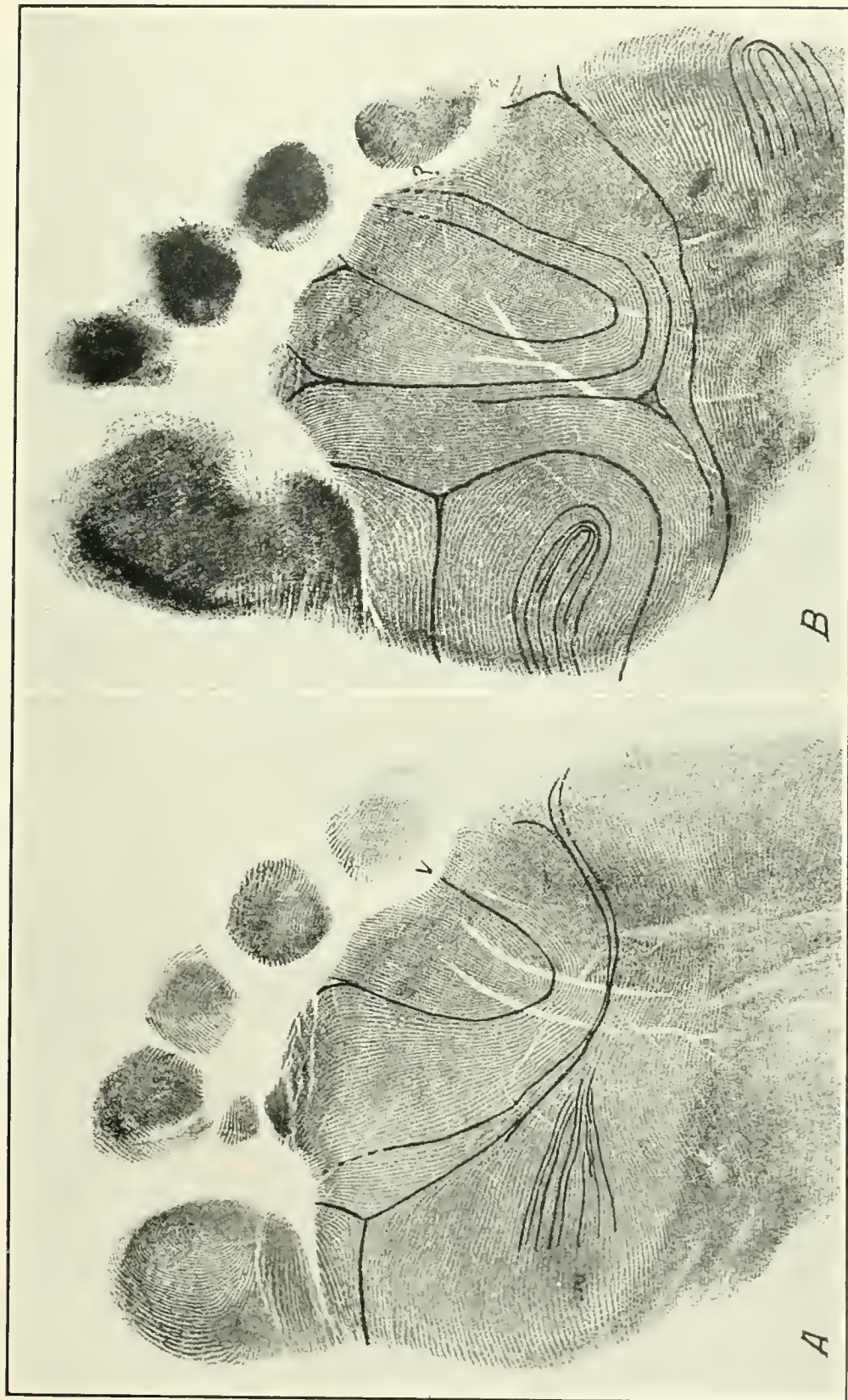
centric circles ; and in the Negroes either the latter or an S-shaped figure, seldom a spiral (2 out of 22).

The second Negro character, which is especially striking when one looks through a set of prints, is the frequency of type B, either by itself or in connection with some other change, as BC (plate XI). Out of 46 soles under discussion, B alone occurs 10 times, and in connection with C six times more, making a total of 34.8 per cent. As this type displays no conspicuous core other than a loop that is often very broad, it frequently appears as though a definite hallucal pattern were lacking, and, indeed, in my first examination of these prints, before the underlying morphological principles had been established, I characterized such cases as "no hallucal pattern." Such a phenomenon, occurring so frequently in a set of prints, cannot fail to arrest attention, and if found to be definitely characteristic of the Negro, will prove a convenient element in diagnosis of race.

A hypothenar pattern (H) seems almost as common in the Negroes as in the whites ; and of the calcar pattern, occurring in the whites at the ratio of about 1 per cent., no trace is found in the 46 Negro soles.

Summary of Negro Sole Characteristics.

- (a) *Plantar areas* : All that can be said here is that in the usual features, such as open and closed areas, etc., the Negroes show nothing that can be considered characteristic. In some points they stand intermediate between Mayas and whites, generally nearer the latter, and in others the correspondence between Negroes and whites is almost exact, points which may be due to the infusion of white blood, which is conceded to be universal.
- (b) *Hallucal patterns* : The most frequent type is the W, the core of which is formed either of concentric circles or an S-shaped figure. The outer triradius is deficient. Type B occurs with far greater frequency than in any of the other races examined, and, through this fact as well as its conspicuous character, may be of considerable use as a racial criterion. Type A is conspicuous for its infrequency, especially as it is the dominant character in the Mayas and very common in the whites.
- (c) *Hypothenar and calcar patterns* : The hypothenar pattern occurs as frequently as in the whites ; a calcar pattern has not yet been recorded.



SOLE PRINTS OF NEGRO CHILDREN, SHOWING CHARACTERISTIC HALLUCAL PATTERNS (NATURAL SIZE)
A, Catalogue No. 175; formula: $BC + 3 \cdot Cl + 1 \cdot \neg$. *B*, Catalogue No. 176; formula: $B + 2 \cdot Cl + 1 \cdot O \cdot H$.

(d) No characteristic *Negro formula* can be ventured upon at present.

C. — CHINESE.

Material. — I have been able thus far to obtain but very little material representing the Mongolian race, my entire collection being limited to prints of nine Chinese, of but four of whom I possess both palm and sole prints (table xx).

TABLE XX.—*List of Prints of Chinese.*¹

CAT. No.	NAME	CAT. No.	NAME
299	Chung Gip	315	Quan Dong
300	Quan Sing	316	Chin Kay
301	Quan Gea	317	Hay Wah
302	Quan Wah	318	Ung Dong
314	Wo S. Mon		

Those that I have are, for the greater part, extremely well taken, and are due to the efforts of Mr Chung Gip of Springfield, Mass., whom I wish to thank in this connection.

TABLE XXI.—*Descriptive Formulæ of the Palms of Nine Chinese.*

CAT. No.	MAIN LINE AND CARPAL FORMULÆ		PATTERN FORMULÆ	
	Left Palm	Right Palm	Left Palm	Right Palm
299	7 · 5 · 5 · 2 · P	8 · 6 · 5 · 3 (?)	H · 0 · 0 · 0 · 3 ^l	H · 0 · 0 · 0 · 3 ^l
300	7 · 5 · 5 · 5 · C	8 · 6 · 5 · 5 · P ^{bt}	0 · 0 · 0 · 0 · 3 ^l	0 · 0 · 0 · 2 ^t · 3 ^l
301	7 · 5 · 5 · 3 · C ^o	8 · 6 · 5 · 3 · C ^o	0 · 0 · 0 · 0 · 3 ^l	0 · 0 · 0 · 0 · 3 ^l
302	10 · 8 · 6 · 2 · C ^o	illegible	0 · ^{tr} · 0 · 0 · 0	illegible
314	5 ^t · 5 · 5 · 5 · P	10 · 8 · 6 · 5 · C ^c	H · 0 · 0 · 0 · 3 ^t	0 · 0 · 0 · 0 · 3 ^{tr}
315	9 · 7 · 5 · 3 · P	9 · 8 · 5 · 3 · P	0 · 0 · 0 · 0 · 3 ^l	0 · 0 · 0 · 0 · 0
316	11 · 8 · 7 · 2 · C ^o	11 · 8 · 7 · 5 · C ^o	0 · 0 · 0 · 0 · 0	0 · 0 · 0 · 0 · 0
317	7 · 5 · 5 · 1 · C ^o	illegible	0 · 0 · 0 · 0 · 3 ^l	illegible
318	10 · 7 · 6 · 3 · C ^c	10 · 7 · 8 · 5 · (?)	H · ^{tr} · 0 · 0 · 3 ^l	0 · 0 · 0 · 0 · 3 ^l

TABLE XXII.—*Descriptive Formulæ of the Soles of Four Chinese.*

CAT. No.	LEFT SOLE		RIGHT SOLE	
299	A ^w	· O · O · O · —	A · O · O	· O · —
300	W ^{adsp}	· O · O ^v · O · —	W ^d · O · O ^v	· O · —
301	A	· O · O ^v · O · —	B · O · O ^v	· O · H
302	A ^w	· O · O ^v · O · —	A ^w · O · O	· O · —

From the descriptive formulæ of these prints (tables xxi and xxii) several points may be obtained, *important in relation to the*

¹ Collected by Mr Chung Gip.
² Palms and soles both ; the others are represented by palms alone.

general question of the paper, that of the racial value of the markings. It will be noticed that the formulæ of the palms are in no way different from those of the other races studied; that, for example, the "Negro formula" $7 \cdot 5 \cdot 5 \cdot 5 \cdot$ occupies a prominent place, and that the higher formulæ also are well represented. In the patterns of the palm, both thenar and hypothenar occur and are of the typical form, showing nothing unusual save perhaps in the single instance of No. 299 right, where the hypothenar pattern takes an unusually low position, yet one that can be duplicated among my collection of hand-prints of the white race.

The formula $5 \cdot 5 \cdot 5 \cdot 5 \cdot$ (314 left) is indeed unique, being the first instance of its kind yet noted, but the singular condition is due to a coincidence of a third lower triradius and an open line C at the same time, thus causing line D at about the middle of the palm to bend sharply back upon itself. The condition is singular, but it may be doubted if it is a distinctively Chinese character, since the remainder of the prints bear such a familiar appearance. *An important point may be noted in the soles: the almost universality of open areas, and if this can be established by other prints as a Chinese or Mongolian character, it will be a point of great ethnological importance.* However, three of the four individuals investigated have the same surname (i. e., first name), Quan, and are probably closely related, thus giving the likelihood that the coincidence is a family rather than a racial character.

In general it may be said that the study of these few Chinese prints is of value in still further emphasizing the conclusion already reached that *the individual palm and sole characters are of no value as racial criteria, and repeat themselves, both in typical form and in all their variations, in human beings of every race thus far examined, races representing extreme, though in no cases absolutely pure, types.*

III. — GENERAL CONCLUSIONS

1. In all the races studied thus far, there is much individual variation in the palm and sole markings.

2. As a result of this a given print can be duplicated, so far as its main features are concerned, among individuals of a totally distinct race.

3. If, however, instead of a single set of prints, a large number be studied and the average occurrence of the various features obtained, these averages will be constant or nearly so for a given race. As a racial diagnostic such results will serve to distinguish peoples widely different from one another, but it is hardly probable that they will be reliable in the case of related tribes. Thus, a collection of Maya prints may be distinguished from an equal number of whites, but it may be surmised that the Mayas could hardly be distinguished from an allied Indian tribe.

4. The number sufficient to obtain reliable averages is not necessarily a large one, as it has been shown that from sets of 13 individuals similar results are obtained. The accuracy, however, increases with the number of prints employed, and, since the two hands show differences in amount of variation, it may be suggested that an ideal set for the study of the palms would consist of the left hands alone of 100 different individuals; for the soles, in the absence of knowledge concerning the relations of left and right, it would be safe to take the same.

5. The greatest amount of variation observed is that seen in the white race, formed in all probability from a vast number of original ethnic elements; and the least is that found in the Mayas, thus suggesting that the nearer one gets to a primitive race the less the amount of variation.

6. The above fact (5) suggests the hypothesis that in an absolutely pure race there may be but one general type of palmar and plantar configuration, admitting slight variations due to difference in proportion between the areas and other elements. It is greatly to be desired that prints be obtained from the purest racial stocks now living, to prove or to disprove this hypothesis.

APPENDIX

The following tables show the main-line formulæ and their relative occurrence in the palms of 100 females of the white race. They are taken from an article by the author in *Popular Science Monthly*, September, 1903, by permission of the editor, Prof. J. McKeen Cattell :

TABLE I.

FORMULÆ	L	R	FORMULÆ	L	R	FORMULÆ	L	R	FORMULÆ	L	R
1 ³ . 7.5.5	1	1	8.6.5.5	2	6	10. 7.6.5	3	4	11. 8.7.2	1	2
1 ³ . 8.7.5	1	0	8.7.6.5	0	1	10. 8.6.3	0	1	11. 8.7.3	1	0
1 ³ . 9.5.5	1	1	9.7.5.1 ¹	1	0	10. 8.6.5	1	2	11. 8.7.4	0	2
1 ³ . 9.7.5	0	1	9.7.5.2	1	0	10. 9.6.2	1	0	11. 8.7.5	4	3
1 ³ . 10.8.11	0	1	9.7.5.3	3	1	10. 9.6.3	1	0	11. 8.9.5	0	1
7.1 ³ . 5.4	0	1	9.7.5.4	3	2	10. 9.6.4	1	1	11. 9.7.1 ^H	1	1
7.5.3.2	1	0	9.7.5.5	0	4	10. 9.6.5	2	2	11. 9.7.1 ¹	1	0
7.5.5.2	2	0	9.7.5.5	5	11	10. 10.6.5	0	1	11. 9.7.3	2	1
7.5.5.3	6	1	9.8.5.3	4	1	10. 10.8.5	0	1	11. 9.7.4	2	0
7.5.5.4	1	1	9.8.5.4	1	0	11. 7.5.3	1	0	11. 9.7.5	4	22
7.5.5.5	2	2	9.8.5.5	2	2	11. 7.5.5	1	0	11. 10.8.1 ¹	0	1
7.9.5.3	1	0	9.8.7.5	0	1	11. 7.7.1	1	0	11. 10.8.4	1	0
7.9.5.5	0	1	9.9.5.3	1	0	11. 7.7.2	1	0	11. 10.8.5	1	4
7.9.5.11	1	0	9.9.5.5	2	2	11. 7.7.3	1	1	11. 11.8.5	0	1
8.6.5.2	2	0	10.7.6.2	5	0	11. 7.7.4	1	0			
8.6.5.3	9	4	10.7.6.4	1	0	11. 7.7.5	8	4			

TABLE II.

TERMINUS	LINE D			LINE C			LINE B			LINE A		
	L	R	Both	L	R	Both	L	R	Both	L	R	Both
1 ^H	—	—	—	—	—	—	—	—	—	1	1	2
1 ¹	—	—	—	—	—	—	—	—	—	2	1	3
1 ²	—	—	—	—	—	—	—	—	—	—	—	—
1 ³	3	4	7	—	1	1	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	2	0	2
2	—	—	—	—	—	—	—	—	—	16	3	19
3	—	—	—	—	—	—	1	0	1	30	11	41
4	—	—	—	—	—	—	—	—	—	8	9	17
5	—	—	—	12	4	16	53	41	94	40	74	114
6	—	—	—	13	10	23	15	12	27			
7	14	6	20	37	29	66	29	38	67			
8	13	11	24	15	15	30	2	8	10			
9	23	24	47	21	32	53	0	1	1			
10	15	12	27	2	8	10	—	—	—			
11	32	43	75	—	1	1	—	—	—	1	1	2

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ARCHEOLOGY OF THE OZARK REGION OF MISSOURI

By D. I. BUSHNELL, JR.

INTRODUCTION

The southern part of Missouri presents an interesting and extensive field for archeological research, and one of which little is known.

The surface of the southern half of the state, south of Missouri river, is very rough and irregular; the bluffs which extend along the Mississippi, and the ridges of Jefferson, St. François, and other border counties may be considered the foot-hills of the Ozarks, which, as they continue westward, gradually rise until, in Green and Dallas counties, they attain an elevation of about two thousand feet. Throughout the region are many rapid streams of clear spring water; the Osage, the Gasconade, and many lesser streams flow northward and empty into the Missouri, while the James, the Black, and others flow in a southerly course and join White river, itself a tributary of the Arkansas. A great part of the country is covered with a heavy growth of timber—oaks and cedars on the ridges and many varieties of soft wood in the lowlands.

That the country was well adapted to the wants and requirements of the native tribes is evident, and that it was at one time thickly peopled is shown by the great number of village or camp sites and other prehistoric remains which have been discovered. The existing evidence and remains of the Indian occupancy may be divided into three classes:

1. Remains in the caves.
2. Village and camp sites.
3. Extensive groups of small mounds.

I.—THE CAVES

Numerous caves exist in the limestone bluffs bordering the Gasconade, the Piney (a branch of the Gasconade), the Niangua, and

other streams throughout the Ozarks. Many are quite large; those near the Gasconade and Piney rivers usually consist of one large chamber having an opening from ten to fifteen feet in height and often fifty or sixty feet in width, while from the main chamber passages lead to other cavities. Few caves are without a stream of clear, cold water several inches deep and four or five feet in width. In many it is possible to ascend the streams several hundred yards.

The caves show evidence of having been occupied for a long period. At the openings are masses of wood ashes and charcoal, filling the space between the sides to a depth of five feet or more — in one cave the depth of the deposit is more than seven feet. The accumulations do not appear to be stratified, but apparently resulted from long-continued occupancy. Intermixed with the charcoal and ashes are implements of stone and bone, fragments of pottery vessels, and shells from the river beds, as well as bones of various animals, birds, and fishes, which served as food. Such vast quantities of ashes are conclusive evidence that man occupied the caves during many generations, possibly centuries.

In a cave near the Piney, a few miles above its mouth, is a small stream about three inches in depth and several feet in width, which enters the main chamber through an opening not more than four feet in height. A few yards up the stream the passage widens several feet and continues so for a short distance; this was caused by pieces of chert having been detached from the mass, *in situ*. The stone had been quarried and used by the Indians, and the bed of the stream was strewn with broken and roughly-formed implements.

This general description will apply to all caves in the valleys of the Gasconade and Piney, as well as to many others in various parts of the Ozarks. No indications of the existence of man preceding the modern Indian have as yet been discovered in the caves.

II. — VILLAGE AND CAMP SITES

The village and camp sites occur in the bottoms, on the banks of the rivers. Where two streams unite there is always evidence of a settlement; in several instances stone implements may be found scattered over an area of ten acres or more, indicating the site of a large village. An extensive village site exists on the right bank of

the Gasconade, a few miles below the mouth of the Piney. Near the center is a shell-heap, fifty or sixty feet in length, in which have been found fragments of pottery vessels and broken implements of stone and bone. Another site, although smaller, occupies the level area on the left bank of the Gasconade opposite the mouth of the Little Piney. On the right bank of the Piney, at the mouth of Spring creek, are the remains of an extensive settlement, near the center of which is a large shell-heap.

Graves are found on the summit of the bluffs overlooking the streams and lowlands. The bodies had been placed either upon the surface or in a slight depression made by removing the thin layer of earth and mold which covered the rocks. Upon and over the remains were placed stones, forming heaps from two to four feet in height. Only small fragments of bone remain, and few ornaments or objects of stone or pottery are ever found in contact with the burials.

A large settlement was also situated at the mouth of the Piney, in Pulaski county; and, indeed, evidence of camps may be found on every prominent and desirable point along the water-courses.

In the valleys of James and White rivers, sites are even more numerous and more clearly defined than in the vicinity of the Gasconade. That part of the state being thinly settled, much of the bottom land has not been cultivated, consequently many of the ancient sites remain as they were left by the Indians.

A very important and apparently extensive site is situated on the E $\frac{1}{2}$, of lot 1, S. W. $\frac{1}{4}$ of Sec. 9, Tp. 22, R. 23, Stone county, on the left bank of White river. Near the center of the site were found four large sandstone mortars, the concavity of the largest being about fifteen inches in diameter and six inches in depth, while the block of stone was more than two feet in thickness. Mortars of similar form, though much smaller, were found on many sites along both rivers. One interesting specimen was found on the village site situated on the E $\frac{1}{2}$ of Sec. 22, Tp. 23, R. 24, Stone county, on the left bank of James river. A rectangular block of sandstone has been used, the concave surface being six inches in diameter. A village covering several acres was once situated on the left bank of White river, near the mouth of Bull creek, in

Taney county ; while only a few miles below, on the opposite side of the river, were indications of a much larger settlement. Numerous camp sites were discovered on the banks of the river, and were always found where creeks entered the larger streams.

Quantities of stone implements were found scattered over the surface of the twenty or more sites which were examined in the valleys of James and White rivers, but not a fragment of pottery was discovered. Evidently earthenware was neither made nor used by the occupants of these villages. On the other hand, while many potsherds are found on the ancient sites along the Piney and the Gasconade, no stone mortars have ever been discovered there. The entire region is worthy of careful and thorough examination ; the results would be of scientific value and doubtless many interesting specimens would be revealed.

These numerous sites, some of which are very extensive, certainly indicate the existence, during some former time, of a large population in the valleys of the Ozarks.

III. — GROUPS OF SMALL MOUNDS

On the high plateau of Dallas county, north of the Niangua, which is a tributary of the Osage, are extensive groups of small, low, artificial mounds. In one a fire-bed was discovered beneath only a few inches of earth and vegetable mold ; in another a small arrowpoint was found near the original surface ; but neither objects nor indications of fire were discovered in any other mound, although many were examined. These mounds occur in groups of from one hundred to one hundred and fifty ; within an area smaller than ten square miles, eight hundred and sixty were counted. They are placed in parallel rows, usually along water-courses or on the western slopes. Many of the mounds were measured and the average diameter found to be forty-five feet, elevation twenty-seven inches.

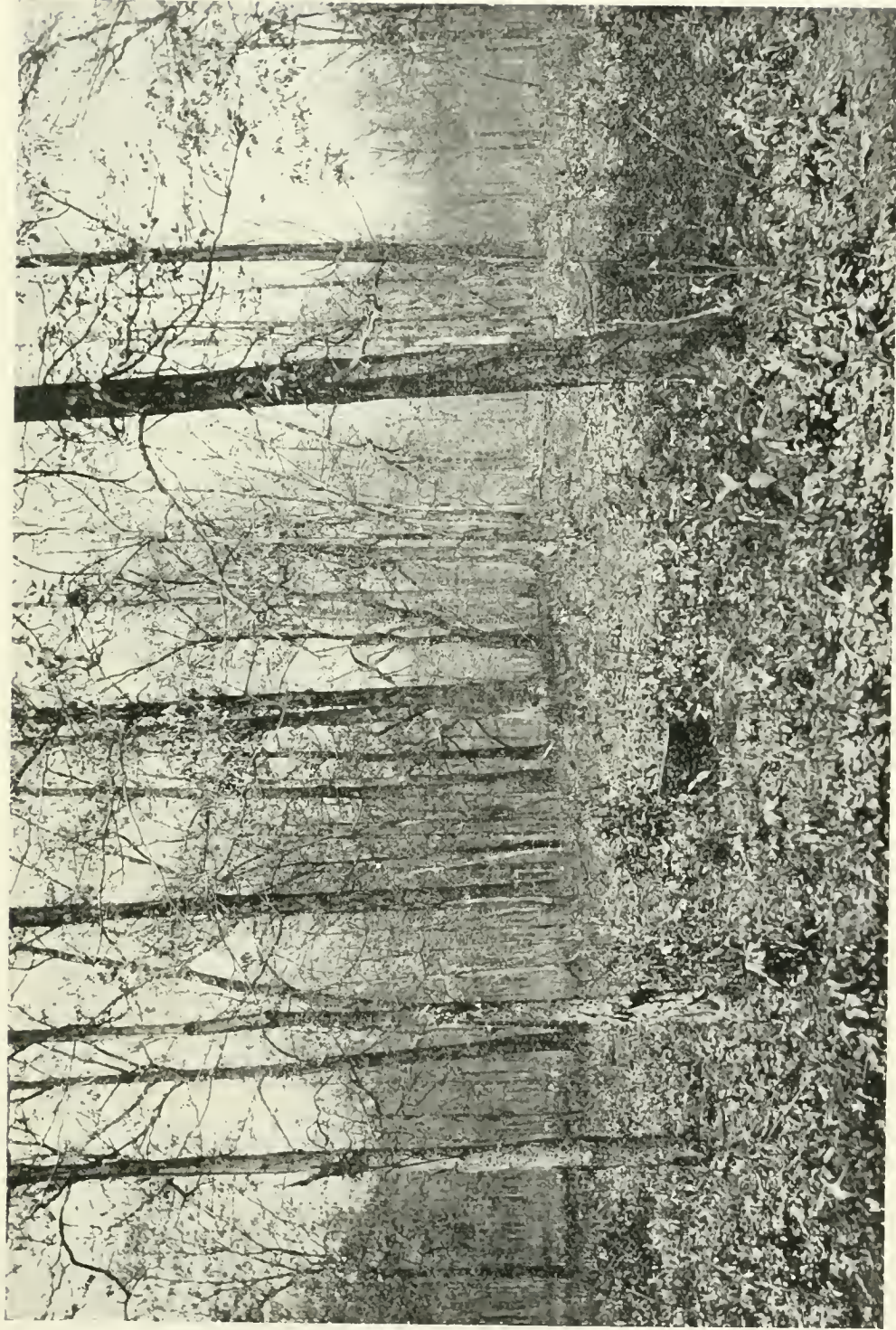
No indications of villages were discovered in the vicinity of the mounds, and no implements of stone or bone were found on the surface. It is difficult to conceive for what purpose the mounds were erected, unless to serve as elevated sites upon which the habitations were placed. If this be the correct explanation, there should cer-

tainly be indications of the occupancy, either in the form of implements or of ashes and charcoal. Nothing of this character, however, is found, and the absence of graves in the vicinity is also difficult to explain.

Near Iron Mountain, in St. François county, more than five hundred of these small mounds, arranged in parallel rows following the direction of the water-courses, were counted within a radius of three miles. The most interesting group is situated in the valley west of Iron Mountain. One mound of this group is shown in plate XII. No objects or graves were discovered in the vicinity.

A group of some fifty similar mounds is situated on the right bank of the Meramec, about six miles above its mouth, in Jefferson county. A few mounds of the same type are also found on the bank of the Mississippi, above the mouth of the River des Peres, within the city of St. Louis.

Many other mound groups are known to exist in different localities, but the description of one is applicable to all.



A SMALL MOUND NEAR IRON MOUNTAIN, SAINT FRANÇOIS COUNTY, MISSOURI

“CASCO FOOT” IN THE FILIPINO

By GEORGE A. SKINNER

Away back in the obscurity of prehistoric times, someone in the archipelago which we call the Philippines built a boat for the navigation of the rivers of those islands. What the type of the primitive boat was is difficult to determine, perhaps, but from the lack of change that has characterized the people since anything has been known about them, one may assume that the modification in structure, if any has occurred, has been gradual and not greatly marked. The presence of certain peculiarities of the people who spend their lives on these boats attracted the attention of the writer soon after arriving in the Philippines, and the abnormal development of the feet especially interested him. There were but few opportunities to obtain photographs of the feet, but the accompanying illustration (pl. XIII, 2) shows a notable example.

A brief description of the *cascos*, as these boats are called, may throw some light on the peculiar foot-development—deformity, one is tempted to call it,—but as such feet are very useful to their owners in plying their particular vocation, one must consider that feet of this formation are an attempt on the part of nature to adapt these people to their occupation.

The *cascos*, as observed in the northern and central parts of Luzon, vary in length from twenty to more than a hundred feet. This description applies to the river boats and not to the sea-going *cascos*. There are seven pieces in these *cascos*—a bottom plank, four side planks, the bow post, and the stern piece. Whatever the length of the boat, the planks forming the sides and bottom are always in single lengths, and this seems to limit their size, as I have never seen one with jointed planking. Along the edges of the planks, where they come in contact with the bottom or side pieces, a row of holes, about six or eight inches apart and nearly an inch in diameter, are bored, and by means of these holes the planks are

laced together with rattan thongs. Two of the side planks are somewhat narrower than the other two, and these are first laced to the bottom and to the bow post. Then the wider planks are laced to the ones last mentioned, forming an overlapping joint with the wider plank outside. The stern piece is then put in place and likewise secured by lacing. All the holes are then calked with coconut fiber, which is first dipped in pitch or tar, if the builders happen to have it. The general form of the casco is that of boats the world over. Their lines as a rule are graceful and they are surprisingly seaworthy. When the hull is completed, strong bamboo poles are placed across the upper surface of the upper plank, and the ends project about three feet over the side in the medium and large boats, proportionately less in the small ones. A boat about a hundred feet long usually approximates five feet deep, and these proportions are relatively maintained whether the casco is a large or a small one. To the projecting poles smaller bamboo poles are laced longitudinally, forming a running-board, on which the boatmen stand when pushing the craft up-stream. Across the running-board, at intervals of ten or twelve inches, are laced bamboo strips, against which the toes are braced when the boat is propelled. A covering, made of a variety of palm leaves, on light but strong bamboo frames, reaches nearly the whole length of the casco, thus protecting the occupants and cargo alike from sun and rain. At the stern is a small elevated platform, just high enough to enable the pilot, who stations himself at that point, to view the length of the vessel. A glance at the illustration (pl. XIII, 1) will probably make the description clearer.

To propel the casco the *bugadores* (boatmen) use long bamboo poles, one end of which is armed with a spike, while the other has a knob of polished wood which rests against the shoulder. When the start is to be made the men place these poles in position against the shoulder, then commence to push by walking toward the end of the casco. When the load is heavy, or the boat is being propelled up-stream, the effort required is very great, and under such circumstances both hands and both feet are used, the entire weight of the body and all the strength of each man resting on the knob of his pole, the other end of course resting on the bottom of



1. Filipino Bugadores at Work



2. Feet of a Filipino Bugador

CASCO FOOT IN THE FILIPINO

the river. The toes and hands both grasp the cross-pieces on the running-board, or the feet may even be elevated until they rest on the casco covering. The positions will be understood readily by noting the attitudes of the men represented in the photograph.

The second man has just commenced to push, the third one is well toward the middle of his exertion, while the fourth and the first ones are just completing a turn and are ready to walk toward the bow of the casco to start again. The third man is using both hands and both feet as mentioned above. The constant use of the toes in this work leads to a peculiar and very great development of the feet. The great toe is especially large and is separated from the other toes until it somewhat resembles a thumb. The prehensile properties of the toes is remarkable, not only in these casco men but in children and in the Filipinos in general. If they drop a small article they almost invariably pick it up with the toes and place it in the hand with the foot without stooping ; indeed I have seen this done when a basket of eggs was balanced on the head.

The feet represented in the illustration were observed on a well-developed, middle-aged man, who had spent all his life on the cascos ; but as we had no language in common I could not obtain his history, and it was with some difficulty that I persuaded him that no harm would come to him if he posed in front of the camera. The feet shown are quite typical of these boatmen, and although I saw many, this was the only one whom I had an opportunity to photograph. The skin of the bottom of the feet is of leathery hardness, for the feet are seldom covered except on occasion of great ceremony, and then only with sandals. The general muscular development of these men is often superb.

Another peculiarity of the casco-men is the development of what has the appearance of a fatty tumor on the shoulders, where the pole rests while they exercise all their strength against it ; but they seem to suffer no inconvenience therefrom. A single effort made by a person unaccustomed to the task will at once demonstrate how necessary this protection is. The "tumor," or cushion, appears to develop soon after the work is begun in youth, and it remains throughout life with little or no change. I have ex-

amined these casco propellers in youth and in extreme age, but could detect no difference in this shoulder growth by the sense of touch. Whether it disappears after a man stops work I am unable to say from observation, although it probably would pass away to a large extent.

I have never observed the abnormal development of the feet in the children, hence it appears to be an occupation development and not hereditary. But, as mentioned above, the prehensile function of the toes takes place early in life, largely because the feet are unhampered by shoes.

SOME EXPLODED THEORIES CONCERNING SOUTH- WESTERN ARCHEOLOGY

By U. FRANCIS DUFF

Since the beginning of systematic investigation in regard to the archeological and ethnological problems of the southwestern portion of the United States, many theories — or perhaps I should say guesses — concerning them have been exploded.

Among these iridescent dreams and wild imaginings, born of fancy and a very limited knowledge of the subject, may be mentioned the exaggerated estimates of early population. In this, misled by the great number of ruins of pueblos, cliff-dwellings, and cavate lodges, the exuberant genius of the observer has had full sway. Some have declared the population ran into the millions. One writer, who had made an investigation of the remains in the valley of the Rio Verde in Arizona, estimated the number of people once occupying it as having been a million and a half, which is, in all probability, twenty-five or thirty times the number of Indians ever existing at any one time in the territory now covered by New Mexico, Arizona, Colorado, and Utah combined.

For many and various reasons the sedentary Indians of the Southwest changed the location of their homes very frequently. This might have been the result of disease, of a failure of water, scarcity of game, or other cause. A great many changes were no doubt the result of sickness, for when an epidemic begins its ravages, the primitive intelligence of the Indian instantly attaches to it some superstitious significance, and his most available remedy is to flee from it. One may therefore imagine what a ruinous mass a many-storied pueblo, consisting frequently of hundreds of rooms, and without even the semblance of sanitary protection, would become in the course of years. To avoid total destruction on the breaking out of a contagious disease, prompt removal to another site would be a necessity. Long drought in any one part of the country might produce the same result, and no doubt often did so. There

are but two inhabited pueblos in the entire Southwest — Acoma and Isleta — that are now on the sites which they occupied at the time of Coronado's *entrada* in 1540. Many pueblos were abandoned also through missionary influence, the missionaries aiming at a policy of concentration in order that they could administer to them more easily. The Pueblo revolt in 1680 resulted in the desertion of practically all the Indian towns, and the nomad tribes, through constant depredation on their more peaceful neighbors, frequently caused the latter to abandon their villages and move to other sites. This constant changing of location, probably for ages before the historical period began, accounts, in part at least, for the large number of ruins scattered throughout the valleys and mountain ranges of the Southwest.

Charles F. Lummis, the able investigator of our southwestern country, asserts that "the Pueblos never counted 30,000 souls." This is the figure also given by A. F. Bandelier and practically agreed to by Cosmos Mindeleff in the *Thirteenth Annual Report* of the Bureau of American Ethnology. The Pueblo population of the region in 1903, according to the report of the Commissioner of Indian Affairs, is less than 10,000.

Another popular fallacy is the belief that the cliff-dwellers and the pueblo or village Indians were distinct and separate races. No doubt the cliff-dweller originally lived in villages situated in the valleys or on the mesas, and was driven to occupy the great natural cavities in the sides of the chasms that here scar the land, simply because they offered a greater degree of security against marauding tribes than did the more exposed type of habitation. On investigation it appears that many of the centers of cliff occupancy had other villages in connection with them, situated either in the lowlands along usually near-by streams, or on adjacent heights. While these eyries might have offered other inducement to their occupants, it evidently was safety, or at least a reasonable degree of security, that caused them to put themselves to the endless labor of getting their supplies up the faces of the almost appalling cliffs in which many of their homes were built.

Some have ventured the assertion, which has been believed by many uninformed persons, that the cliff-dweller was a dwarf, basing

the statement on the fact that the doors of their dwellings are seldom more than three or four feet high and relatively narrow. This mode of construction was a most natural one, for a low door, which would put an invader to the necessity of stooping to enter, could be more easily defended than a large one, and would be better protection from severe weather. An examination of the human remains found in the cliff-dwellings proves conclusively that the inhabitants of these lofty abodes were people of ordinary size, and that they were no more dwarfs than were the mound-builders giants.

In view of the facts mentioned, it is scarcely worth while to discuss the theories of the advocates of a belief in a former vast population in the prehistoric Southwest — such as that the people were entirely swept away by some great pestilence, that they migrated in a body, or that they were driven out by fumes emanating from volcanic eruptions.

While traditions of migrations exist among all the tribes, many of the latter probably being made up of accretions from other tribes, as in the case of the Navaho and the Hopi, there is no evidence whatever that any great exodus has occurred.

The dead are not found scattered promiscuously through the ruins, but, almost without exception, are observed to have been laid away with the usual rites. This fact would also preclude the possibility of any great massacre having taken place.

Bandelier mentions what has, beyond question, been a potent means of decrease in the population — the constant inter-killing in the tribes on the charge of being possessed of evil spirits and of practising witchcraft. Sorcery, indeed, is practised even at the present time, as recorded by Mr Lummis and others, and as the records of the civil courts of New Mexico show. Intertribal wars and wars with the Spaniards have been even more disastrous.

It has even recently been stated in print, with a view of substantiating a belief in the great antiquity of southwestern occupancy, that ears of corn embedded in lava have been taken from ruins in central New Mexico. This apparently lavafied corn has more likely resulted from the destruction of the village or villages by fire, certain of the materials of which the walls were composed vitrifying through the intense heat of the burning

timbers and running over the corn stored in some of the rooms of the structure.¹

The "Gran Quivira" myth to the effect that the place was the depository of vast wealth, was long ago exploded by Bandelier, and later in a popular article by Mr Lummis, published in *Scribner's Magazine* for April, 1893, afterward reprinted in his delightful volume, *The Land of Poco Tiempo*.

At different times reports of finds of gold in southwestern ruins have been circulated, but the best information later obtainable tended only to disprove them. Nor have any precious stones been discovered, aside from turquoise beads and ornaments, of which those found in Pueblo Bonito, in Chaco cañon, by Mr G. H. Pepper of the Hyde Expedition, are the most noteworthy.

Science demands only facts, and it is well that all adventitious and extraneous matter—the cobwebs of tradition and the crude imaginings of the ill-informed—should be swept away. In this work Messrs A. F. Bandelier, Charles F. Lummis, and those connected with the Bureau of American Ethnology at Washington have been widely recognized factors, and it may now be said that, largely through their efforts, southwestern archeology and ethnology have been placed on a scientific basis.

¹ Owing to the belief prevalent in the Southwest, especially in central and western New Mexico, of the existence of pueblo ruins within the great lava flow in the vicinity of Mount Taylor (locally called San Mateo), I made a special investigation of the question in 1897 and 1899, pursuing every clue encountered and finally tracing the origin of the myth to a cowboy, residing in the vicinity of San Rafael, near Grant Station, on the Santa Fé Pacific Railroad. This individual, it was asserted, while rounding-up stray cattle in *malpais*, had seen the ruins, the walls of which were of stone, and that the lava had poured in the door and window openings. When I offered to reward him handsomely if he would take me to the spot, he denied having seen any ruins of the character mentioned, nor was I able to obtain more definite information from four local surveyors who had traversed the country during many years. Later search resulted only in the discovery—within the limits of the once molten stream, to be sure,—of some rude stone walls that had been constructed at a period long subsequent to the flow and at points not actually touched by it. Encrusted corn, such as that mentioned by Professor Duff, has been found in several localities in New Mexico, but there is little doubt that the incrustation consists not of lava but of slag from the immense communal ovens, such as those uncovered by the Hemenway Expedition in the Salado valley of Arizona. — EDITOR.

HEREDITARY RESEMBLANCES IN THE BRAINS OF THREE BROTHERS¹

By EDWARD ANTHONY SPITZKA

To demonstrate the influence of heredity in the configuration of the human brain has long been the wish of brain anatomists. A few cases of brains of new-born twins and triplets are on record,² but owing to the comparatively primitive degree of individual differentiation in the disposition of the cerebral fissures and gyres in the brains of the new-born, no safe conclusion could be reached. No adequate adult material of this kind has been described except the brains of the two distinguished physicians Seguin, father and son, which it was the writer's good fortune to obtain for comparative study four years ago.³ It may be mentioned here that in the Seguin brains I attributed certain interesting points of resemblance to hereditary transmission. I again had the good fortune to test the question of encephalic morphological transmission in the brains of three brothers who were recently executed together for a murder in New York state. Through the kindness of the prison officials, notably Mr George Deyo, the warden, and Dr J. B. Ransom, the prison physician, it was my privilege to perform the autopsies, and I naturally

¹ Read before the Association of American Anatomists, Seventeenth session, Philadelphia, Pa., December 29, 1903.

² N. Rüdinger, Ueber die Hirne von Zwillingen, *Anat. Anz.*, Ergänzungsheft. z. ix Bd., 1904, p. 177. G. Retzius, *Das Menschenhirn*, Stockholm, 1897, Text, p. 90. Waldeyer, Ueber Gehirne von Drillingen, *Correspondenzbl. d. deutsch. Ges. f. Anthropol., Ethnol. u. Urgeschichte*, xxxiii, 11 u. 12, Nov.-Dec., 1902, p. 128.

³ E. A. Spitzka, A Preliminary Communication of a Study of the Brains of Two Distinguished Physicians, Father and Son, *Proc. Assoc. American Anatomists*, Fourteenth session, 1900, pp. 70-92; *Phila. Med. Jour.*, vii, No. 171, April 6, 1901, pp. 680-688. E. A. Spitzka, The Redundancy of the Preinsula in the Brains of Distinguished Educated Men, *N. Y. Med. Record*, LIX, No. 1597, June 15, 1901, pp. 940-943. Since the publication of my paper on "Three Eskimo Brains" (*American Journal of Anatomy*, vol. 11, No. 1, pp. 25-71, 1902), I have been informed by Lieutenant Peary that "Nook-tah" and "Ah-wee-ah" were father and daughter. As in the case of the Seguins, the absence of the other parent's brain seriously interferes with the search for conclusive evidences of hereditary transmission.

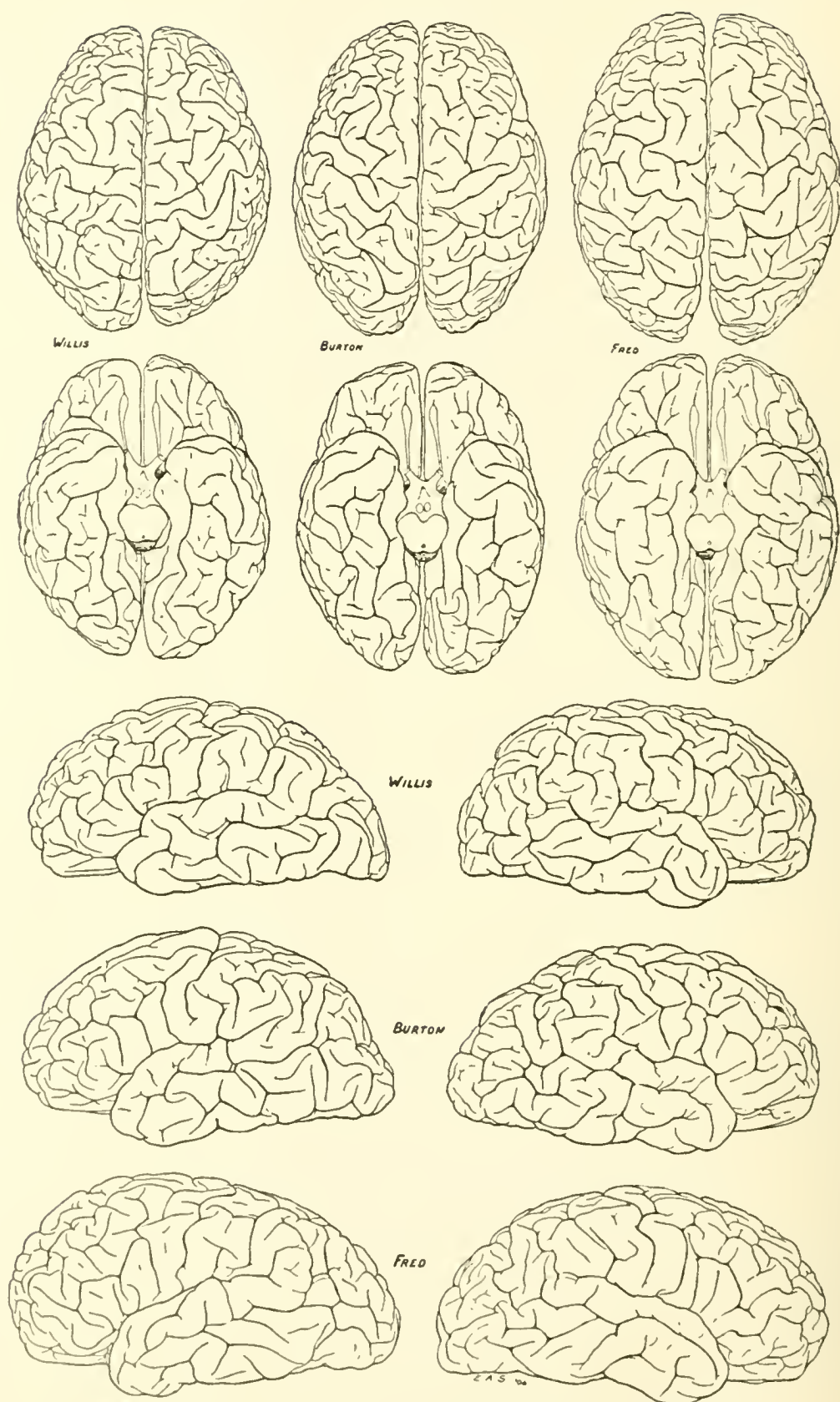


FIG. 6. — Dorsal, ventral, and lateral views of the three Van Wormer brains.

directed my attention especially to the brains. The opportunity afforded by this triple execution was certainly most rare, and a similar case will not soon occur again, unless it be during some widespread epidemic of a fatal disease, or in the course of an overwhelming catastrophe.¹

To doubt that heredity plays an important rôle in the development of the brain were to cast aside a vast array of facts which prove any portion of the body-structure to be rigorously limited by this factor. The transmission of ancestral conditions is a matter of everyday observation, if we but compare the physical and mental traits of blood relatives. If we recall the many families of musicians, families of linguists, families of biologists; or the French orphan child mentioned by Darwin as having been brought up out of France, yet shrugging like his ancestors; or recalling, on the other hand, those sad cases of transmission of insanity, of alcoholism, of epilepsy, in short, of most any kind of disease or defect, the far-reaching importance of this life-force must be manifest to everyone. Nevertheless, the problem of why "like begets like" is one of the most complex topics of biology. With this, the anatomical structure of the human brain is the most complex of all the organs. The study, then, of "brain-heredity" were difficult enough if more material were at hand. Our inquiries in this direction are rendered still more difficult by that other great though not yet thoroughly understood law of organic evolution — the law of variation. If no two animals and no two plants can be said to be exactly alike, this is certainly true of the brains of men. The surface of the human brain, while it is patterned in accordance with a general ground-plan presenting the same essential features in all normal brains, yet shows, if examined in detail, many differences recognizable not only in the brains of different races and individuals, but also in the two cerebral halves of the same individual. The primary fissures and certain other stable formations of the cerebrum do not exhibit many marked modifications in different brains. But there are other parts

¹ The writer has recently learned of the acquisition, by Professor L. F. Barker of Chicago, of the brains of two brothers in Dr Sanger Brown's series of hereditary ataxia (*Proc. Association of American Anatomists*, Sixteenth session, 1902). It is also possible that the brains of Dr C. H. E. Bischoff and his son, the anatomist, T. L. W. Bischoff, have been preserved in the Munich collection.

subject to great range of variation — parts which, morphologically speaking, are in a state of “unstable equilibrium” in the evolutionary process. Peculiarities of anatomical configuration of this class, uncommon enough in the general run of brains as they come to the hands of anatomists, if similarly reproduced in the brains of blood-relatives may, I think, be confidently brought forward as evidences

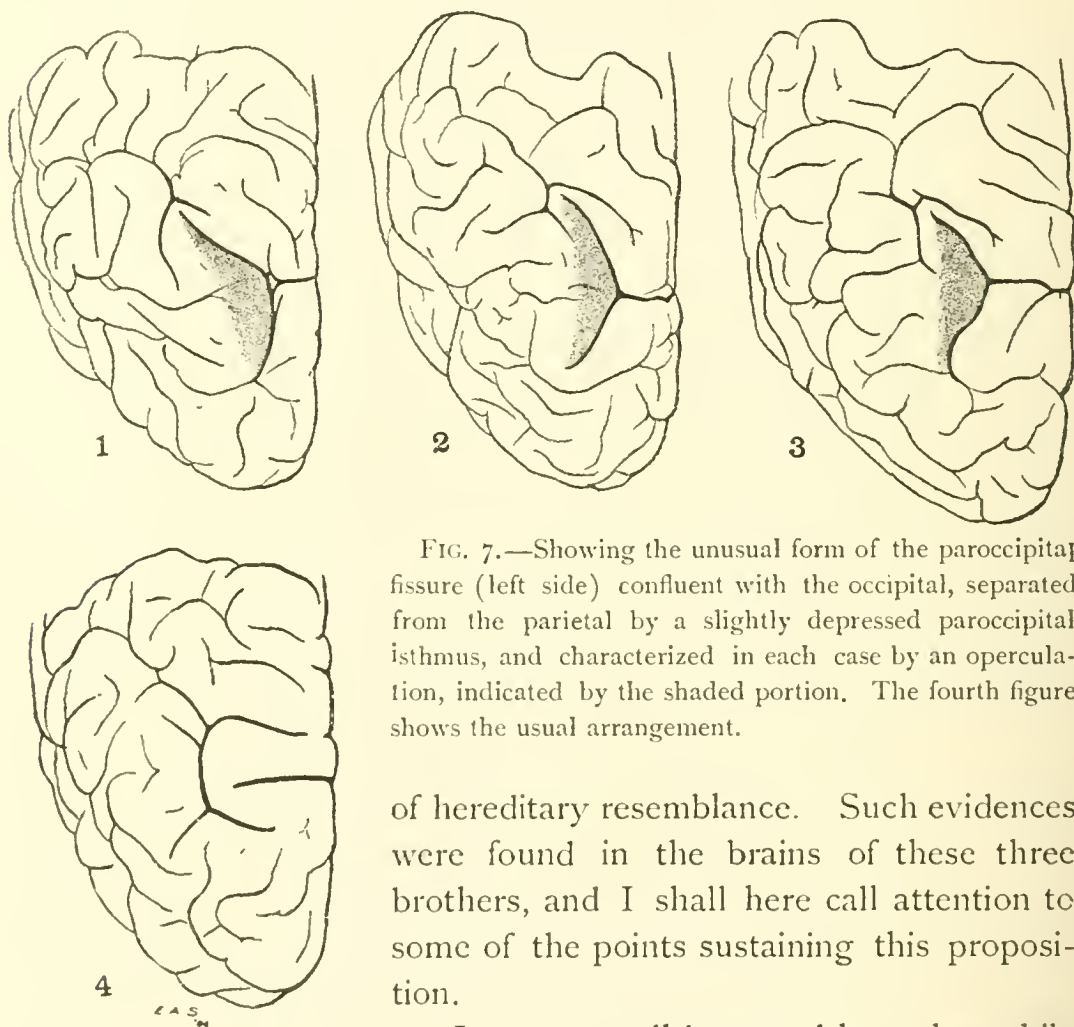


FIG. 7.—Showing the unusual form of the paroccipital fissure (left side) confluent with the occipital, separated from the parietal by a slightly depressed paroccipital isthmus, and characterized in each case by an operculum, indicated by the shaded portion. The fourth figure shows the usual arrangement.

of hereditary resemblance. Such evidences were found in the brains of these three brothers, and I shall here call attention to some of the points sustaining this proposition.

It may as well be stated here that while the brothers resembled each other in outward physiognomy as well as in general physique, they differed with reference to the size of the head, although the conformation was quite similar. It was found that the youngest of the three had the largest head and the heaviest brain, while the eldest had the smallest head and the lightest brain.¹ In the absence of an anthropometric life-record it is im-

¹ The anthropometric data in these cases are given in the writer's report of the post-mortem examination in *The Daily Medical*, vol. 1, No. 1, Feb. 8, 1904, and, briefly, in *Science*, Nov. 27, 1903, p. 699.

possible to say to what this difference in head-size and brain-weight is actually due. The more likely explanation may be found in the fact that there had occurred a somatic improvement with each suc-

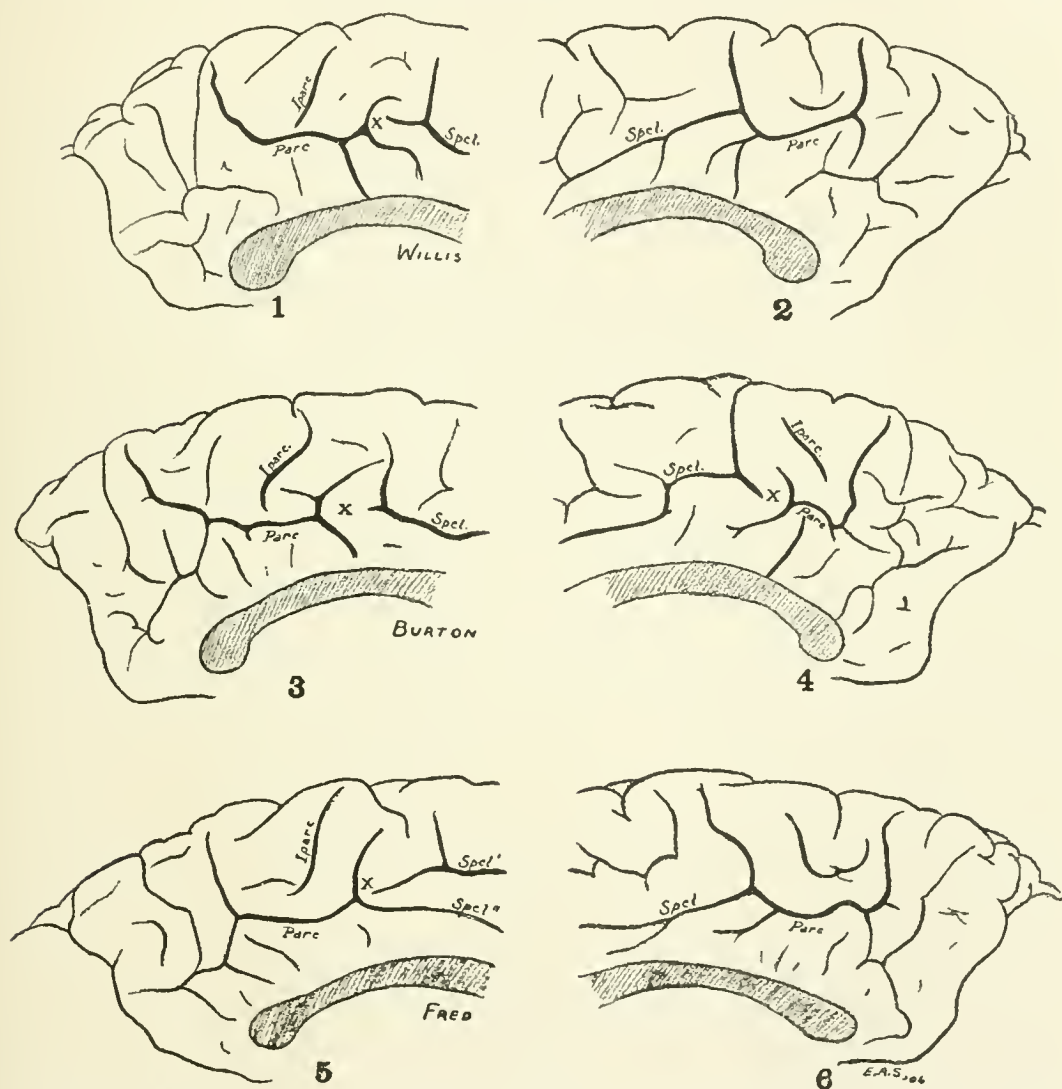


FIG. 8.—Mesal view of paracentral region of both hemispheres in the three brains^s. Note separation of the paracentral fissure (*Parc.*) from the supercallosal (*Spcl.*) in four (1, 3, 4, 5) of the six hemispheres, while the remaining two (2 and 6) resemble each other. Note also the oblique intraparc. in 1, 3, 4, and 5, while in 2 and 6 there is a curved element.

cessive birth, expressed by a larger size of the head in the third as compared with the first born.

The form of the brains, like that of the heads, is similar in all three (fig. 6); viewed dorsally, the narrower and less bulging left frontal lobe is seen to be a characteristic feature in all three brains ;

this is particularly marked in Willis, the eldest. The relative proportions of the various cerebral parts are much the same as ascertained by careful measurements. Although the cerebra differ in absolute size, the callosum is of exactly the same length in all three; nor do the dimensions of the cerebellum and pons differ materially in the three.

To come to the details of the cerebral markings, I wish to call attention to the similarity of the gyral physiognomy — a similarity which would appeal to the average skilled observer if they were placed in juxtaposition with, say, any other three brains taken at hazard. Further than this, however, I desire to point out (fig. 7) the unusual form of the paroccipital fissure, confluent with the occipital by the cephalic stipe, separated from the parietal fissure by a slightly depressed paroccipital isthmus, and characterized in each case by an operculation, i. e., the subparietal portion tends to lap over the paroccipital gyre. I do not recall ever having seen quite such a formation in over two hundred brains carefully examined in this region in particular, and its recurrence upon the same side in the brains of three brothers, born, respectively, four and two years apart, is certainly striking. Yet further we note (fig. 8) the separation of the paracentral from the supercallosal in four of the six hemicerebra, while the remaining two resemble each other. Other similarities are to be found in the disposition of the left superfrontals, and of the right supercentrals, with adjacent paramesial elements. The right postcentral fissures are almost exactly alike in two (Willis and Fred). The combination of these with other minor similarities lend great weight to the supposition that they are hereditary signs and not fortuitous.

THE TAPEHANEK DIALECT OF VIRGINIA

By WILLIAM R. GERARD

On May 21, 1607, just a week after the landing of the English on the peninsula that was to form the site of the settlement called Jamestown, Captain Newport, with a party of twenty-three men, started up the river on a voyage of discovery, and finally reached the Indian village of Powhatan,¹ one of the residences of the "great emperor" of the country, consisting of about a dozen wigwams situated upon a high bank on the left side of the stream, a few miles below the lower falls.² On attempting to proceed beyond this place, the explorers found their passage impeded by "great craggy stones" in the midst of wide, violent, and shallow rapids, and were obliged to turn the prow of their pinnace in a homeward direction.

Captain John Smith, who was one of the party, tells us that, on the return voyage, Captain Newport "intended to have visited Paspahagh and Tappahanocke," but, observing something in the behavior of the natives at Wynauk³ that led him to fear that the Indians around the fort might be engaged in some mischief, he took advantage of a change in the wind and returned with all speed to Jamestown, where he discovered that his suspicions had been well founded. We are here introduced, for the first time, to two words which were destined to figure somewhat prominently in the accounts of the colony; the first, because it was the name (as the ears of the settlers caught it) of a "churlish and treacherous nation," residing

¹ "Powhatan, of which place their great Emperor taketh his name" (Smith), = *paüä-tán*, 'falls in a current' — a kind of pitching rapids which the French aptly call *sauts*, 'leaps,' of water. See Appendix A of a subsequent article in which will be discussed some ill-understood points of Algonquian grammar that involve the meaning of certain words.

² Strachey gives, as the native term for "the falls of the upper end of King's river," *paqwachowng* (i. e. *paquatchöung*). The word stands for *pékwätshû'wäng*, 'where there are shallow rapids'; pres. particip. of imper. vb. *pâ'kwätshû'wän*, 'there are shallow rapids.'

³ A "low meadow point" about 13 miles above Jamestown. *Winâk*, 'strong-scented wood,' was, in the Roanoke, Virginia, and Lenape dialects, the name of the sassafras tree. The name has been preserved, in the form of Weyanoke, as that of a village situated upon the point, in Charles City county.

about eight miles above Jamestown, which claimed the land of which the English had taken possession, and which, as well as the territory itself, derived its name from some previously existing *wiróance*; ¹ and the second, because it was one of the appellations of a people on the south side of the river whose ruler, like the *wiróance* of Paspahagh, on the opposite side, was the "contracted enemy of the English," and never suffered an opportunity of committing some act of hostility to escape him, until a threat from Powhatan had the effect of putting a quietus upon both chieftains, and of causing them to exhibit a more friendly spirit toward the *Otasan-tasuwak*, ² whose progress they had jealously watched.

The chief town of the Tapahanocks was situated ten or twelve miles above Jamestown, on the east side of a creek called, according to Strachey, Coiacohanauke. ³

In the latter part of the year, after making three brief explorations of the "country of Chickahamania," ⁴ Captain Smith set out on December 10th to make a thorough exploration of the river that flowed through it. After proceeding about seventy miles he was captured by a hunting party under command of Opechankanu, ⁵ the *wiróance* of Pamaunkee, ⁶ who took him by a circuitous route

¹ See Appendix B.

² *Otá'santásu* means, possibly, 'wearer of leg-coverings,' the reference being to the breeches and long hose worn by the newcomers. The body-garments worn by the English were likened by the Indians to their own winter mantles of skin, and called by them by the same name *mä'tshikóre*, or, in another dialect, *mä'tshikôte* (later on, corrupted by the English to *match-coat*), = Ojibwe *mä'tshigóde*, a woman's petticoat, lit., 'it hangs badly,' i. e., it is loosely suspended and does not conform to the contours of the body.

³ "Coiacohanauke, which we commonly though corruptly (i. e., erroneously) call *Tapahanock*.' This word stands for *Kaiákuhá'nek*, 'gull-stream.' *Käiakw*, 'gull,' = Roanoke *kaiá'kw*, = Milicite *kiá'kw*, = Lenape *kiahákw*, = Caniba *kaákw*, = Ojibwe *gaiāshk*, = Cree *kiyāsk*. The stream is now called Upper Chipoak, or Chipoak's creek; so named probably from Chopoke, who was a brother of the ruler of the Tapahanocks and who lived at the village of Chawapo on the east bank of the stream.

⁴ This word stands for *tshikēhā'mēn*, a 'clearing,' literally, 'swept off,' 'scraped off.' The suffix *-ia* was added by Smith, as in some other words, to give the name a sort of Latin appearance. The word, with an excrescent vowel, afterward became the name of the river.

⁵ *O'pítsha'kwēnú*, 'man of a white (immaculate) soul.'

⁶ *Pamaunkee* (*Pēma'ki*), 'sloping hill,' or 'rising upland'; probably the site of the three great "temples" of the Powhatans, upon some elevations, within the forks of what are now called the Pamunkey and Mattaponi rivers.

through several native towns, and, after a march of five days, returned with him to Orapaks,¹ one of Powhatan's hunting towns in the vicinity of the place where he was taken prisoner. Then, in another journey, the objective point of which was Werawocomoco,² where Powhatan was then living, they led him to the residence of *wiróance* Keketou,³ in Pemaunkee. This "kind king" took him in charge and escorted him to a place called Topahanock, a "kingdom" situated on a creek flowing from the north into a river of the same name.

"This riuer of *Topahanock*," says Smith, "seemeth in breadth not much lesse then that we dwell vpon. At the mouth of the Riuer is a Countrey called *Cuttatawomen*; vpwards, *Maraughtacum*, *Topahanock*, *Appamatuck*⁴ and *Nanstangstacum*." The river is laid down in Smith's map of 1612 as the Toppahanock, a name by which it was known, by the whites at least, as late as 1649.⁵ In his *Generall Historie* (1624) Smith retains the name Toppahanock for the river, but changes the name of the town, which received its appellation from the creek on which it was situated (and which doubtless gave its name indirectly to the river) to Rapahanock; while some of the writers from whose narratives Smith compiled a part of his work refer to the stream as the "river which some [Indians] call Rapahanocke, others Tapanocke." Since the letters T and R which form the initials of these two names would seem, from a phonetic view point (more especially to those unacquainted with the mechanism of speech), to

¹ Spelled also *Oropikes*, the name apparently of a deep pond or small body of water (-*pikēs*) in a depression of land (*áro*, for *wáro*).

² *Wirówáká'mäku*, 'fertile land'; a tract about two miles in breadth on the east side of what is now known as Timber Neck bay, on York river.

³ *Kíkítou*, 'he harangues,' 'makes speeches,' = Nipissing *Kíkító*, = Natick *Kíúktú*, etc.

⁴ *A'pämä'tēkú*, 'curved river,' a designation for the part of a tidal river in which a bend exists; verbally, *ápämä'tēkwé*, 'the river makes a curve,' 'turns about.' The name was applied in Virginia to several places situated in the vicinity of a river-bend, and particularly to an Indian village near a curve in James river, the site of what is now Bermuda Hundred. The village gave its name to Appomattox river, *i. e.*, the river of the Apamateks, who lived in the village just mentioned.

⁵ "The first river up the West is James River . . . ; the second is Charles River . . . ; and the third is called by the Indian name Tapananuke."—*A Perfect Description of Virginia* (1649), in Force's *Tracts*, vol. 11.

stand so wide apart as to preclude the idea that one name was a corrupt form of the other, due to a mishearing, it has doubtless been supposed by readers of the early history of Virginia that the words were formed from roots of an entirely different meaning. Such is not the case, however, for the two names are really coradicate, as is shown by a careful study of the "Dictionarie of the Indian Language" appended to Strachey's *Historie of Trauaile into Virginia*, which reveals the fact that in the confederacy over which Powhatan ruled there were spoken three Algonquian dialects, viz.: (1) an *R*-dialect¹ (that of Powhatan and his family), probably the most widely diffused and exhibiting some local differences; (2) an *N*-dialect; and (3) a peculiar speech resembling the dialects of the Cree group in the use of the letter *t*, in certain positions, for the *r*, *l*, *n*, *s*, and *sh* of the dialects of the other groups of the Algonquian language.

SOME ALGONQUIAN LETTER-CHANGES

In the Cree group² of dialects, which for various reasons, phonetic especially, may be regarded as the oldest of the Algonquian family, the consonant *t* (1) as the initial letter of a limited number of roots,³ but (2) more especially, and *always*, when it directly follows the vocalic initial *a* or *i* of a root; or (3) is the characteristic of a root; or (4) is the initial or "energizing" letter of the termination of ani-

¹ What is meant by an *R*-, *L*-, or *N*-dialect is one in which, in certain positions, and in such positions *only*, in a root or in the grammatical portion of a word, one of these three letters is used to the exclusion of the two others. Such substitutions or permutations are made according to certain laws of Algonquian letter-change, and not by mere caprice, since in such an event any dialect would be rendered unintelligible and be converted into a mere jargon. An Indian using an *N*-dialect cannot pronounce the letters *r* or *l*, and there is no reason whatever why he should be able to do so; but one who speaks an *R*- or an *L*-dialect must necessarily be able to pronounce *n*, since this letter is the initial of certain particles that are common to all Algonquian dialects, and cannot undergo any change without rendering them meaningless.

² When I speak of Cree, I refer more particularly to the dialect called Prairie Cree ("Cree properly so called," as Père Lacombe styles it), which is spoken by a larger population and with greater purity and elegance than are the other dialects, and has undergone fewer phonetic changes and been less influenced by contact with the Ojibwes.

³ Of the 124 roots and radical words with initial *t*, recorded in Père Lacombe's *Dictionnaire de la Langue Crise*, 63 are peculiar to Cree. Of the remainder, 30 have passed (in some cases with a change of *t* to its sonant *d*) into Ojibwe alone; 21 into Ojibwe and various other dialectic groups; and 6 have undergone the change of *t* to *r*, *n*, and *l*, mentioned above.

mate transitive verbs ; or (5) is the initial letter of the termination of certain inanimate verbal adjectives and impersonal verbs, is, *as a rule*, represented in the dialects of the other Algonquian groups by *r*, *l*, or *n*, or, in cases (1) and (3) by *y* (consonant) in Niantic.¹

The *t*, *tt*, or *st* of Cree is often represented in the dialects of other groups by *s*, *ss*, or *sh* (or guttural *ch* in Minsi), as (6) the characteristic of a root ; (7) in the formatives of active verbs ; (8) in particles that modify the sense of words ; and (9) in certain radical words and generic nominal suffixes.

The use, as above noted, of the linguo-dental *t*, in the position occupied in the dialects of the other Algonquian groups, by one or another of the linguo-dentals *n*, *l*, or *r*, is a characteristic peculiarity of Cree, which is differentiated into dialects by the employment, *in certain positions*, again, of *th*, *y* (consonant), *r*, *l*, and *n*, which, like *t*, correspond to the *r*, *l*, and *n* of other Algonquian groups ; but Cree never interchanges its group-characterizing *t* with the *th*, *y*, *r*, *l*, and *n* of its own dialects. A study of Algonquian phonetics seems to show that this *t* is a survival from the primitive Algonquian language, of which Cree ("properly so called") may be regarded as the eldest daughter.

EXAMPLES OF THE ABOVE RULES OF LETTER-CHANGE

1. Cree *tikk*, 'to melt,' = Lenape *rĩnk*, *ĩnk*, = Ojibwe *nĩng*, = Virginia *rũng*.

2. Cree *ātā'm*, 'beneath,' = Ojibwe *ānā'm*, = Natick and Narragansett *ānā'm*, = Lenape *ārām*, *ālām*, = Caniba *āra"m*.

Cree *īt* (adverbial prefix), 'thus,' 'in such a manner,' = Ojibwe *in*, = Natick *ūn*, = Lenape *ēr*, *ēl*, = Virginia *ēr*, = Caniba *ēr*.

3. Cree *pīt*, 'strange,' = Nipissing *pĩn*, = Ojibwe *bin*, = Lenape *pĩr*, *pil*, = Caniba *pĩr*, = Penobscot *pil*.

4. Cree *nĩ kītótāu*, 'I speak to him,' = Ojibwe *nĩn gānóna*, = Old Nipissing *nĩ gālūla*, = Caniba *něgērūra*, = Natick *někēnūnāu*.

¹ Two curious exceptions to rule (5) are found in the dialect that was spoken in the vicinity of Jamestown. I refer to the words *mā'tshūkóre*, 'it hangs badly,' the name for a skin mantle ; and *pākāhikārē*, 'it is brayed,' whence, by aphæresis, we have our word "hickory." In both of these words the *r* of the suffix would be regularly *t*. The effect of the change in the first-mentioned word is to make it ambiguous, since the suffix *kóre* in the same dialect denotes 'flaming' or 'blazing.'

5. Cree *wâ'säskúteú*, 'it blazes,' = Ojibwe *wâ'säkóne*, = Caniba *wâ'säküre*, = Virginia *wásäkóre*, = Lenape *wásägúleú*.

6. Cree *nitt*, 'to descend,' = Ojibwe *niss*, = Virginia *niss*, = Lenape *nish* (Minsi dial.), *nich*.

7. Cree *-útteu* (suffix), action of 'going afoot,' = Ojibwe *-ósse*, = Abnaki *-ússe*, = Natick *-úsheu*, = Lenape (Minsi dial.) *-óchweu*.

8. Cree *-tĩ* (particle), action of 'putting' an inan. object, = Ojibwe *-sĩ*, = Abnaki *-sě*, = Natick *shĩ*, = Lenape *-shě*, (Minsi dial.) *-chě*.

9. Cree *mĩ'tti*, 'firewood,' = Ojibwe *mĩ'shĩ*, = Virginia *mũ'ssi*, *mũ'shi* (wood), = Natick *mĩsh* (wood).

Cree *mótteú*, 'worm,' = Ojibwe *mósse*, = Virginia *músseú*, = Miami *móssĩa*, = Lenape (Minsi dial.) *móchués*.

Cree *tä'sstäu*, 'between,' = Ojibwe *nä'ssäw*, = Natick *nä'shäu*, = Virginia *rä'ssäw*.

As regards the *T*-dialect of Virginia, the *t* here, besides corresponding to the *t* that characterizes Cree as a linguistic group, bears, in certain positions, the same relation to the Wood Cree voiceless spirant *th* that the latter does to the *y*, *r*, *l*, and *u* of the Prairie, Montagnais, Naskapi, and Muskegon dialects respectively. Howse regards this spirant as the primitive letter. But the dialect under consideration differs from Cree in the use of both the French and English nasals, neither of which exists in Cree, but both of which are found in the language of the people who spoke the *R*-dialect and with whom the Tapehaneks came into constant contact. As in the Cree dialects, assibilation seems to have been common in this Virginia speech, an original *t* often passing through *ts* to *sh*; and, as in some other Algonquian dialects, *w* was discarded when it was the initial letter of a root of which the vowel was *a* or *o*. From the few lexical elements that exist, we find that the terminal *u* of verbs and verbal adjectives (which has weathered away in Ojibwe and Abnaki) was preserved, and that there was some borrowing of formatives that are foreign to Cree, but that were used in the other Algonquian dialects of Virginia.

From the above considerations, and some others that will appear farther along, I am led to the conclusion that the people who spoke this dialect belonged to the Cree group, and, at an early period, found their way from Canada to Virginia where, through their new

associations and environment, change of climate, etc., their language underwent certain alterations, but none of sufficient importance to mask its origin.

According to the statements of the early explorers of what is now called Rappahannock river, the Tapehaneks of that stream occupied at least nine villages to the northwest of the seat of the ruler of their territory, but how many to the southwest cannot be ascertained.

The jurisdiction of the ruler of the Tapehaneks on the James, whose residence was upon an eminence now called Wharf Bluff, just east of Upper Chipoak creek, probably extended from Apamateku (now Bermuda Hundred) southeast to Warraskoyac,¹ the seat of *wiróance* Tackonekintaco² on the west side of what is now called Cypress creek, an affluent of Pagan creek, in Isle of Wight county. At a few miles to the south of James river, the territory of the Tapehaneks adjoined that of an Iroquoian people who doubtless owe to them their appellation of *Nâ'towéwok* (*Anglice*, Nottoways), pl. of Cree *Nâ'towéu*, an Iroquois Indian.³

From Smith's map the country of the Tapehaneks, who in 1607 numbered but 25 fighting men (according to Smith, but 60 according to Strachey), seems to have been sparsely settled. Since there was more or less intercourse between these people and the settlers at Jamestown, by "quintan"⁴ and pinnace respectively, it is probable that the words recorded in the Glossary were collected among

¹ Spelled also Waraskweag, for *Wâraskik*, 'swamp in a depression' (of land). Judging from the name of the stream, the village was near what in the South is called a "cypress brake" — a basin-shaped depression of land situated near the margin of a creek and filled with fallen cypress trees.

² He is described as a very aged man, and hence perhaps his name — properly, *Takû'ntikâ'ntikeû*, 'he does not dance and sing' (*kâ'ntikâ'nti*).

³ This term is found also in Ojibwe (in the form *Nâdowé*), in which it appears as a loan-word, and in which it is used also as the name of a species of rattlesnake (*Caudisoma tergemina*?). The Algonquians of Albemarle sound knew their Iroquoian neighbors by the name of *Mängöäk* (Lenape *Méngwäk*, Abnaki *Mégwäk*). The Iroquois who occasionally descended from the north upon the tribes of the tidewater region of Virginia were designated by the Algonquians north of the James by a term which the English wrote *Massawomek*, doubtless for *Mä'chewo'mik*, 'great-plain people.'

⁴ Aquintayne (Strachey), = *äkwintén*, = Abnaki *ägwidén*, canoe, literally, a 'float' < *äkwinte*, *ägwide*, 'it floats upon.' The term *ägwidén* was used metaphorically by the Narragansetts as a designation for an island.

them rather than among those who spoke the same dialect on the Rappahannock.

Finally, then, as is above stated, *Tápěhă'něk* and *Rápěhă'něk* are (as may be seen under the root *tap* in the Glossary) dialectic forms of the same word, and mean 'the stream that ebbs and flows' (lit., that 'alternates in flow'), the definite and specific form of *Tápěhă'ně* and *Rápěhă'ně*, 'a stream that ebbs and flows.'¹ In the *N*-dialect the word would have the form of *Nápěhă'něk*.² Discarding the inappropriate term "Powhatan," which has hitherto been loosely used as a general name for the Algonquian dialects of Virginia, I shall, in the "Glossary of the Tapehanek Dialect" that follows, designate the three dialects by the above-mentioned names, in the abbreviated form of *Tap.*, *Rap.*, and *Nap.*

In the transliterations enclosed in parentheses after the words as printed in Strachey's *Dictionarie*, the alphabet of the Bureau of American Ethnology has been used, with the exception of the letters *c* and *tc*, for which I have employed *sh* and *tsh*, and of *q*, for which I have used *ch*. An apostrophe (') before the name of a part of the body of man or animals denotes the aphæresis of a possessive pronoun, and, in the body of a word, the syncope of a vowel; while a superior reversed comma (ˆ) before a consonant is a mark of aspiration. A large number of the words in Strachey's *Dictionarie* terminate in *s*, the mark of the English plural. In such cases, in the corrected spelling, I have simply discarded that letter without remark.

For the sake of brevity, the following well-known signs are used: < *from*; > *whence*; = *cognate with*; * *not on record*, but a regular form.

A GLOSSARY OF THE TAPEHANEK DIALECT

aitowh (*etou*, or *etohu*), a ball.³ The prefix *ai* is probably miswritten for the usual Virginia prosthetic *û*; and, if so, the word would

¹ For a description of the peculiar tidal phenomena exhibited by the creeks and 'branches' that flow into the rivers of Virginia, see *An Account of Virginia*, by J. Clayton (1688), in Force's *Tracts*, vol. III.

² In the Niantic dialect it becomes *Yan'pěhă'něk*, which, abbreviated first to *Yamp-hank*, and afterward changed to *Yaphank*, has been transferred as the name of a stream to that of a village in Suffolk county, on Long Island, N. Y.

³ Henry Spelman, interpreter for the colony of Jamestown, writing in 1609, says: "They [the Virginians], vse, beside, football play, which weimen and young boys do

have been *ûtóhu*, an apocopated form, say, of *ûtóhuwûn*, = Cree *tóhuwán*, a ball < *tóhuwéu*, 'he plays ball,' < root *tóhu*, which is a Cree radical, and, in Ojibwe, occurs only as a particle in words relating to the Canadian game of "lacrosse."

attaankwassuwk (*äta''kwûsäk*), pl. of *äta''kwûs*,¹ a star, = Prairie Cree *ätákus*, or *ätshákus*, dim. of *ätak*, *ätshák*, = Wood Cree *ütshák*, = Ojibwe *änáng*, *ünû'ng*, = Nipissing *änánk*, = Old Nipissing *älánk*, = Sauk *änákwa*, = Shawnee *älákwa*, = Kikapu *ünákwa*, = Lenape *älánkw*, *äránkw*, = Miami *älánkwa*, = Menomini *anáchk*. In the following dialects, diminutives are used as the common form: Natick *änä'kwûs*, Quiripi *ärä'ks*, = Penobscot *älákus*, = Mohegan *änä'kwâth*. These words are all radical.²

attemous (*ät'tëmús*, or *ät'témús*), dog,³ = Prairie Cree *ät'tëmús*, or *ät'témús*, = Caniba *är'rémús*, = Penobscot *äl'lémús*, = Milicite *ä'limús*, = Micmac *ä'lûmûsh*, = Ojibwe *ä'nîmo''s*, = Old Nipissing *ä'limo''s*; all diminutives. Simple forms: Prairie Cree *ätti'm*, *äti'm* (or *ästi'm* in composition), = Wood Cree *ätshî'm*, = Naskapi *ätû'm*, = Montagnais *ät'témú*, = Ojibwe *änî'm*,⁴ = Old Nipissing *äli'm*, = Menomini *aném*, = Lenape *ärû'm* or *älû'm*,⁵ = Natick *änû'm*, = Niantic *äyî'm*.

much play at. The men neuer. They make ther Goales as ours, only they neuer fight and pull one another doune. The men play with a litel balle, lettinge it fall out of ther hand and striketh it with the tope of his foot, and he that can strike furthest winns that they play for."

¹ In another Virginia dialect the name for a star was, as written by Smith, *pumma-hump*, a word in which the second *p* is excrescent. *Pûmáhûm* means 'it sails about.' Among some of the Algonquians the firmament is likened to a vast ocean upon which the stars and planets sail here and there. Hence the Lenape name for the moon, *Nîpáhûm*, 'it sails at night,' and Mohegan *Nîpáhûnk*, 'that which sails at night'; and the Nipissing name for the three stars of the belt of Orion, *A'tawáämók*, 'they sail in company.'

² Howse's interpretation of Cree *ätcháak*, as 'other Being,' and Trumbull's explanation of the Natick *änä'kwûs* as 'he appears,' 'shows himself,' may be mentioned merely as examples of curious speculation.

³ Captain Smith says: "Their Dogges of that Country are like their Woolues, and cannot barke, but howle;" and the word given by Strachey with the meaning of 'to bark' means 'he makes a noise' (see *Cuttoundg*). The animals mentioned by Smith were doubtless of the species described by Lesson under the name of *Canis caraibicus*, the dog observed by Columbus on one of the islands of the Lesser Antilles, and now very common in Peru, where it is held in contempt.

⁴ The Ojibwes use the word *animosh*, a derogative form, as the name for a dog, the simple form *anim* being employed only as an opprobrious epithet, in the same way that we sometimes use the terms "dog" and "cur" and the ancient Mexicans used the word *koyotl* (coyote, a congener of the dog).

⁵ Another Lenape name for dog, probably the introduced species, is *mówekáneû*, 'he eats bones,' a very apposite term.

The simple forms of the above names (all radical words), in which the *w* (not represented in the spellings given), which forms an integral part of the characteristic *m* of the word, was formerly pronounced (see Appendix C), were originally general terms for a 'wild animal,'¹ and were applied by the Indians specifically to the native dog from its usefulness to them as a beast of the chase and beast of burden; just as the Tupi of Brazil applied the name *tapiira*, 'wild animal,' to the European ox run wild; as the Kechua of Peru transferred the name *llama*, 'wild animal,' to a species of *Auchenia* from its value as a beast of burden; and as the English applied the name *deer* (A.-S. *deor*), 'wild animal,' to a species of *Cervus*, owing to its importance in the chase. They are, through the laws of Algonquian letter-change, doublets of: Ojibwe -*ässim*, Abnaki -*ässēm*, Virginia -*ässim*, Natick and Narragansett -*äshim*, Micmac -*üssim*, Lenape (Minsi dial.) -*ächüm*, nominal suffixes (never employed as independent words, except in the case of the Cree cognate *ättim*) denoting a mammiferous quadruped, a wild beast (but, by the Ojibwes, used with qualifying prefixes as names for the different varieties of the dog).

The cognation will be rendered more apparent by the following examples: Cree *wâ'pätim*, *wâ'pättim*, or *wâ'pästim*, 'white dog' (also 'white horse'), = Ojibwe *wâ'bässim*, 'white dog,' = Abnaki *wâ'bässēm*, 'white beast,' = Virginia *ópässim*, 'white beast' (the opossum), = Natick *wâ'päshim*, 'white beast,' = Minsi *wâ'pächüm*, 'white beast.'

For Cree *t* = *r*, *l*, and *n* of the other Algonquian linguistic groups, see Rule (2); and for Cree *t*, *tt*, and *st* = *s*, *ss*, *sh*, and *ch* (Minsi), see Rule (9) and examples.

attonce (*ätöns*, for *ätüns*), arrow,² = Prairie Cree *ätús*, = Naskapi *ätúsh*, = Caniba *ärús*, = Lenape *ärüns*, *älüns*, (Western) *älünth*, = Pamptico *ärüns*: < a root *ätw*, *ärw*, *alw*, *änw*, of unknown meaning. In some of the northern and western dialects the suffix is changed and the word becomes: Nipissing *änwi*, = old Nipissing *älwi*, = Shawnee *älwi*.

¹ The early observers of the fauna of the northern parts of this country regarded the dogs which they saw in possession of the natives as animals that had been originally wild — a sort of mongrel wolves, that the Indians had domesticated. Josselyn (*Voyages*, p. 94) says of them that they were "begotten betwixt a *Wolf* and a *Fox*, or between a *Fox* and a *Wolf*, which they [the Indians] made use of, taming them, and bringing of them up to hunt with." Harriot (1590) states that he and his companions on Roanoke island occasionally ate "their [the Indians'] *Wolues* or *woluish Dogges*," as the latter came into their hands, and adds: "I have not set [them] downe for good meat." Strachey says of the Virginia animals that they "are not unlike those auneyent doggs called *cracutæ*, which were said to be engendred of a wolfe and a bitch."

² See Appendix D.

bagwanchybasson (*päkwa^wtshīpisun*), a girdle. See *paqwanteewun*.

cattapeuk (*katápeék*), spring (season). A loan-word from a dialect in which the form was *karápeék* < *kar*, 'fine,' 'beautiful' = Lenape *kar*, *kal*, = Abnaki *kal*, = Nap. *kwan*,¹ + the participial formative *-ápeek* denoting 'time when,' = Lenape *-ápeek*, = Abnaki *-ábēk*, = Natick *-a^wpek*, = Ojibwe *-ábīg*. The word thus means 'when the weather is fine,' but is more accurately translated by French 'quand il fait beau temps.' The eastern Algonquian root *kar*, *kal*, seems to be related to the Cree radical *kataw*, 'to be beautiful,' 'fine.'

cotapesseaw (*kótäpī'sseú*), 'to overset, or a boat to turn keele up' (Strachey), literally, 'it becomes turned upside down.' < Tap. root *kótäp*, 'to turn in an exactly opposite direction,' = Wood Cree *kútūp*, = Ojibwe *gónäb*, = Lenape *kúlūp*, or *gúlūp*, = Caniba *kúrēp*. The root has also the following forms: Prairie Cree *kwétip*, = Nipissing *kwénīb*, or *kwánäb*, = Natick *kwínūp*, = Narragansett *kwénūp*. The suffix *-isseu*, = Ojibwe *-isse*, = Natick *-isheu*, is foreign to Cree, and is borrowed from one of the other Virginia dialects.²

cuppotaw (*kūpū'teú*), deaf; lit. 'he (or she) is deaf' (in one ear only). In the Algonquian dialects, when more than one bodily organ of the same class (eyes, ears, legs, arms, etc.) is affected by any peculiarity, accident, ailment, or infirmity, the verbal adjective denoting the state or condition of such organs is put in a dual form, for which Abbé Cuoq has proposed the name of "duplicative," and which consists in a simple reduplication of the initial letter and the vowel of the root of the word. Sometimes, however, in order that, in certain cases, *quid pro quos* may be avoided and greater perspicuity be attained, the dual takes the form but not the signification of the frequentative, and sometimes, though rarely, that of the distributive.

The particle denoting the ear in animate verbal adjectives is, in Cree and Tap., *-te*, = Ojibwe *-she*, = Abnaki, Natick, and Narragansett *-se*, = Minsi *-che*. EXAMPLES: Cree *kaképītēu*, 'he (or she) is deaf' (stone-deaf), = Ojibwe *gagī'bīshé*,³ = Abnaki *kakē'pēsé*, = Natick *kakū'p'seú*, = Minsi *gegē'p'cheú*; all < root *kīp*, *gīb*, *kēp*, *kūp*, 'to shut up,' 'close' or 'obstruct.'

¹ Found in a Virginia name for rainbow, *qwannacut* (Strachey), for *kwannákāt*, 'it is of a beautiful aspect.'

² See Appendix E.

³ The Nipissings, through association with the Crees, have thrown aside the Ojibwe suffix *-she* and adopted the Cree, minus the terminal verbal suffix *u*, which, in Ojibwe, has been lost.

cutssenepo, **cuchenepo**, woman (nickname); by assibilation of $t < kû\check{t}ê'něpó$, a loan-word $<$ Rap. $kê\check{r}ê'něpó$ (contracted to $krê'něpó$), for $kê\check{r}ê'něpéu$, water-carrier, lit., 'she carries water'; $<$ root $kê\check{r}ên$, = Lenape $gêlên$, = Natick $kênân$, 'to carry,' and the intrans. vb. suffix $-péu$, denoting (according to the root) action in, upon, with, or by water. For change of vb. suffix $-péu$ to $-o$, compare (as written by the English in Virginia) *wingapo* for *wingápeú*, friend, lit., 'well-disposed man,' and *marapo* for *márapéu*, enemy, lit. 'bad man.' Some other by-names of the same character for woman are: Caniba *mána''dägwě'su*, 'gatherer of fir-branches'; Prairie Cree *kiskitá'sis*, 'short breeches,' or 'pantalets'; and Quiripi *kě'rěkwébûs*, 'tied about the head,' probably from some peculiar style of arranging the hair.

cuttoundg ($kûtu''ju$),¹ 'to bark' (Strachey); lit. 'he makes a noise,' a doublet of Rap. *kârûsu*, 'he speaks,' found in the iterative form *kákârûsu*, 'he speaks at some length'; a word that has descended to us, in the spelling "cockarouse," as the title of a Virginian *wiróance's* counsellor.

kesshekissun ($kě'shěki'sûn$), 'to laugh' (Strachey); through assibilation of $t > ts > sh^2 < kě'těki'sûn$, which has the termination of the 1st and 2d pers. sing. (Cree $-sîn$, Lenape $-si$, Ojibwe $-s$), the 3d pers. being $kě'těki'su$, 'he (or she) laughs,' = Lenape $gě'lûki'su <$ root $kětěk$, $gě'lûk$, 'to laugh,' but, primarily, 'to tickle,' or 'be tickled,' as in Wood Cree *kithûk*, Prairie Cree *kîyäk*, Ojibwe *gînäg*, Nipissing *kînäk*, and Menomini (by assib. of the guttural characteristic k)³ *kînäts̄h*. The change of sense from cause (tickling) to effect (laughter) is quite natural.

mattoume (*mätüm*, apocop. form of *mätümën*), the seed of a kind of grass which "they use for a dayntie bread buttered with deares suett" (Strachey);⁴ = Rap. *märümën*,* not on record as an independent word,

¹ See Appendix F.

² For $sh = ts$, assib. of t , compare the Virginian word *kěsshěmāk*, 'poor,' 'weak' (Strachey), for $kě'tēmā'ki <$ root $kětēmā$, 'to be poor,' 'wretched,' 'miserable,' = Abnaki *kětēmā*, = Lenape *gětēmā*, = Natick *kâtümā*, = Cree and Ojibwe *kětēmā*.

³ Such assibilation of the guttural k occurs occasionally in other Algonquian dialects, and is common in Montagnais and Naskapi (Cree), in which we find *tshir* and *tshil* for *kir* and *kil*, 'thou,' *tshino* for *kino*, 'long,' *nitshik* for *nikik*, 'otter,' etc., etc. We find it also in Narragansett, in the word *sachim* (*sātshim*), for *sākim*, and in Pequot *sünjum* (*su''djûm*) for *su''gûm*, = Abnaki *sa''g'man''*, = Lenape *sākimān*. The same phonetic phenomenon, as is well known, is found likewise in English, in such words as *thatch* (*thatsh*) for *thak*, *chin* (*tshin*) for *kin* (Anglo-Saxon *cin*), etc.

⁴ The grain was probably wild rice, the seed of *Zizania aquatica*, which grows along the marshy borders of some of the Virginia rivers, and was doubtless the Virginia "reed" mentioned in Ilakluyt as bearing "a seed almost like unto our rice or wheat, and being boiled is good meat."

but found in combination in *ápärüménán*,¹ defined by Strachey as 'parched wheat,' *i. e.*, Indian corn, which, in early times, was called 'wheat' in Virginia; = Abnaki *mälóměn*, a grain of wheat, = Lenape *mälúm* (for *mälúměn*), a grain of wheat, = Old Nipissing *mälóměn*, a grain of wild rice, = Ojibwe *mänómín*, *mûnómín*, a grain of wild rice: < root *mätú*, *märú*, *mälò*, *mänò*, *mûnò*, *mëñò*, corrupt forms of *mërú*, *mëlú*, *mëñò*, *mïthò*, *mïyo*, 'good,' 'fine,' 'excellent,' + *-mën*, *-mîn*, 'seed,' 'grain'; > *Menomini*, 'wild-rice people.'

matatsno (*metétänó*),² the tongue, < *m*, indef. prefix, + *tétänó*, = Wood Cree '*téthäní*, = Prairie Cree '*téyäní*, = Ojibwe '*dénäní*, = Menomini '*tä'nuníu*. In some dialects the word has a shorter form: Miami '*lá'ni*, = Shawnee '*láni*, = Lenape '*rä'nu*, '*lä'nu*, '*läno*, = Caniba '*rä'ru*, = Mohegan '*nä'no*, = Natick '*nän*, = Nanticoke '*länu*, = Micmac '*lé'nu*, = Sauk '*nánëwë*.

mussaangegwak (*mûsa''djigéwak*),³ 'maneaters' (Strachey); lit. 'they eat much' (inanimate food), = Cree *mîsâtjikéwak*.

nahapue (*nähäpiu*), 'to dwell' (Strachey); lit. 'he (or she) is well (or comfortably) seated (or placed),' = Cree *nähäpiu*, = Nipissing

¹ From *apeu*, 'he (or she) cooks' (in any manner), from which, by separating the root, *ap*, and verbal suffix, *eu*, and inserting the word *märüměn* (with regular loss of *m* in composition), we have *ápärüménëu*, 'he (or she) cooks corn' > *ápärüménán*, 'cooked (parched) corn.' It would appear from this word and the Tap. *mätüměn* (which is simply borrowed with change of *r* to *t*), that *märüměn* was anciently a name for Indian corn in Virginia, and afterward transferred to wild rice, and another term, (*pä'kütä'u*, or *pä'gätóu*) selected for corn. Their meaning would make the above-mentioned cognate names apposite for any kind of grain useful to the Indians, and so, perhaps, their specific application was not always definite. Carver (*Travels*, 1788) gives *mëlómín* as the old Nipissing term for Indian corn, although the name (usually spelled *mälúmín* or *mälómín*) was usually, in that dialect, that of wild rice.

² The second *t* here corresponds to the Cree *th*, *y*, *r*, *l*, and *n* series of linguo-dentals.

³ This Virginia word finds a place here because it presents a phonetic peculiarity common to Cree and Ojibwe, but not found in the dialects of the Abnaki, Lenape, and Massachusetts groups, and that is the assibilation ("softening" — Howse) of the initial letter *t* or *d* of the suffix of the inanimate indefinite form of certain active verbs. Trumbull, in a paper on "The True Method of Studying the North American Languages," regards the *j* (Ojibwe) or *j* or *sh* (Cree) following the letter *d* or *t* as a "characteristic of energetic action." Such, however, is by no means the case, since this assibilation takes place mostly in verbs in which the particle that modifies their meaning in the animate and inanimate transitive forms, expresses, in the majority of cases, what Howse calls a "mitigated" degree of energy, or no forcible action whatever, such as thinking, loving, tasting, seeing, hearing, etc. The reason why the names of certain tools end in *-gän*, and those of others terminate in *-djigän* or *-tsihgän* in Ojibwe and Cree is extremely simple, but would require too much space for its explanation here.

nääpi, = Ojibwe *nääbi*. The adverbial prefix *näh*, *nä*, 'well,' 'properly,' 'skilfully,' is found only in the Cree and Ojibwe groups.

nimatewh (*nimä'teü*), a man, = Rap. *nima'roü* (for *nimä'reü*), = Mohegan *nimä'neü*; a loan-word from the Rap. dialect, with change of *r* to *t*.

Nottoway (*Nä'towéu*), an Iroquois Indian, = Cree *Nä'towéu*, = Nipissing *Nä'towé*, = Ojibwe *Nä'dowé*.

The Cree word is formed from the auxiliary root *nât* (which, as a prefix, gives the meaning of 'to go in search of' whatever is specified in the verb) and the verb *mówéü*,¹ 'he eats flesh-food.' The word would thus mean 'he goes to seek flesh to eat,' an assertion that might naturally be made of a person regarded as a cannibal; and that the Iroquois were anthropophagi was an opinion generally held by the Algonquians. *Nä'towé* or *Nä'dowé* would thus be a loan-word in the Ojibwe dialects, in which the verb *mówéü* does not exist, but is replaced by *ämwá*, a word from the same root (*mo*, *mu*) with a prosthetic vowel.

opotenaiok (*ópätä'niä'k*), pl. of *ópätäni*, 'white-tail,' the bald eagle (*Haliaeetus leucocephalus*), = Lenape *wápälä'ne*, (Unami dialect) *ópälän*. See *ottaneis*.

otakersheheis (*otä'kishihí*), bowel, gut, intestine, lit. 'his (or her) bowel'; =: Prairie Cree *'tä'kisi*, = Wood Cree *'tû'kusi*, = Ojibwe *'nä'gij*, = Ottawa *'nä'gish*, = Nipissing *'nä'gish*, = Old Nipissing *'lä'kish*, = Lenape *'ä'k'si*, *'lä'k'si*, *'lä'k'shi*, = Natick *'nä'kü's*, = Narragansett *'nä'k's*.

otaus (for *otous* = *otús*), a woman's breast (*mamma*); lit. 'her breast'; the simple form of a radical, *tos*, *tus*, or *tosh*, found reduplicated in Cree *'totós*, or *'totús*, and Ojibwe *'totósh*.²

ottaneis (*otä'ni*), the tail of a bird; lit. 'its tail'; = Cree *'tä'ni*, = Caniba *'rä'ni*, = Lenape *'rä'ne*, *'lä'ne*, = Ojibwe *-nä'ni* (suffix), = Menomini *-näm* (suffix), = Natick and Narragansett *-nä'nu* (suffix).³

ottawm (*otä'm*, apocop. < *otä'män*),⁴ defined by Strachey as 'earth,' but really a name for colored clay such as is used by the Indians as a

¹ Algonquian roots with the initial *m*, *n*, or *w*, discard such letter when, in composition, they are preceded by another root.

² Perhaps a dual form denoting two of a kind. A similar reduplication is found in the name for the eyebrow; Ojibwe *mamá*, = Abnaki *maⁿmaⁿn*, = Lenape *mamáwon*, = Natick *momóin*.

³ One of the Virginia names for a turkey-cock given by Strachey is *aspanno*, an apocopated form of *äspä'nänu*, 'he raises the tail.' The word belongs to a Nap. dialect.

⁴ This word belongs to the *th*, *y*, *r*, *l*, and *n* series of Cree linguo-dentals.

body-pigment: = Rap. *orâ'măn*, = Nap. *onâ'măn*,¹ = Ojibwe *onâ'măn*, = Shawnee *olámăn*, = Caniba *ura'măn*, = Menomini *onámăn*, = Lenape *wurámăn*, *wulámăn*, = Narragansett *wunám*, = Prairie Cree *wiyâ'măn*.

The root of these words is *thâm*, *tâm*, *yâm*, *râm*, *lâm*, and *nâm*; the suffix *-ăn* is a formative, which is always discarded when the terms are used attributively; and the prefixed vowel is simply expletive. This radical apparently corresponds in meaning to the Aryan root *pig*, 'to color,' found in the Latin word *pigmentum*, and the formative *-ăn* to the *-mentum* of that term. Since red is the favorite color of the Indians, the name is applied by them specifically to paint of that hue (usually ferruginous clay naturally red, or the same material of a yellow color made red by roasting). When it becomes necessary to designate pigments of other colors (the Algonquian scale of which, at least, is very limited), the prosthetic vowel is dropped and the proper adjective prefixed, as, for example: Abnaki, *wâ'bîlâ'măn*, 'white paint,' Ojibwe *ósanâ'măn*, 'yellow paint,' etc. The above words, then, may without doubt be regarded as equivalent to the Latin term *pigmentum*, and the English term *paint*.

outacan (*utâ'kăn*),² a dish (primitively, a dish made of bark); = Wood Cree *uthâ'găn*, = Prairie Cree *oyâ'găn*, = Montagnais *urâ'găn*, = Ojibwe *onâ'găn*, = Old Nipissing *ulâ'găn*, = Caniba *ura'găn*, = Penobscot *ulâ'kăn*, = Lenape *urâkăn*, *ulâkăn*, = Natick *wunâ'găn*, = Narragansett *wunâ'găn*, = Mohegan *wânâ'kăn*.

These names for one of the most primitive of aboriginal household utensils are of very peculiar formation, and may, perhaps, be regarded as radical words. The prefixed vowel is simply expletive, and the suffix *-âgan* denotes a 'utensil.' This leaves as a basis for the formation of the word an active verb consisting of a consonant and one vowel, *e*, or per-

¹ Found in *Onawmanient*, a name understood by Captain Smith and others to be that of a place on the Potomac, and now preserved in the form of Nominy as the designation of a bay and village. The name is evidently personal, and the word stands for *Onâ'măniwî*, 'he who paints' (i. e., himself). The term was perhaps applied by the Potomac river Indians to the warriors of the locality, individually, from the extraordinary and fantastic manner in which they decorated themselves with war-paint. On the 16th of June, 1608, while Smith and a party were exploring the Potomac, two Indians guided them into what is now called Nominy bay, "where," says the chronicler of the event, "all the woods were laid with Ambuscadoes to the number of 3 or 400 Salvages; but so strangely painted, grimed, and disguised, . . . as we rather supposed them so many divels."

² This word belongs to the *th*, *y*, *rl*, and *n* series that differentiates Cree into dialects.

haps two vowels, *eu*. This would make the root of the word simply a consonant! ¹

paqwantewun (*päkwäⁿtehún*), 'leather that covereth their hips and secretts' (Strachey).² This word is cognate with Cree *päkwä'tehún*, a girdle. The root *päkw*, 'to wind about' or 'around,' is confined to the dialects of the Cree group. The particle *-aⁿt* (Cree *-ât*) denotes repetition, and, when used as a prefix, is the exact equivalent of Latin *re-*. The nominal suffix *-hún* (Ojibwe *-ón*, *-hón*, = Natick *-hóun*, = Abnaki *-hún*) is from the intransitive (sometimes reflective) verb suffix *-húw* (Ojibwe *-ó*, *-hó*, = Natick *hóu*, = Abnaki *-hú*), denoting the action or manner of wearing some article of apparel or bodily adornment (ear-rings, bracelets, finger-rings, etc.), or of carrying some object that aids or affords relief to the body or some part of it (as a cane, tooth-pick, etc.). The word describes an article of attire which, owing to the part of the body upon which it was worn, had to be frequently changed in order to assure cleanliness.

The Virginia name *päkwäⁿtshípísun*, for a girdle or sash, is from the same root, + *-aⁿtsh*, 'again,' + *-písun*, 'tie,' or 'band' < anim. adj. suffix *-písu*, 'tied.'

puttawus (*pútérwús*), a feather mantle;³ from a root *pút*, which is possibly a weak form of the Cree root *pust*, 'to put on,' 'invest' (said of apparel), a radical which has no cognate in any other Algonquian group of

¹ The rule (not given in grammars) for forming the names of 'utensils' is this: If, to an intransitive verb, we add the suffix *-âkeu*, *-âgeu*, *-âke*, or *-âge* (according to dialect), we shall form another intransitive verb which asserts that the subject *makes use of* something for the purpose indicated by the root. By changing the verbal termination *-e* or *-eu* into *-än*, we shall have the name of an object *used for* something — a *utensil*. For example: Virginia *ótäméu*, 'he aspires,' 'draws with the mouth,' hence 'drinks,' > *ótämâ'keu*, 'he uses for drinking,' > *ótämâ'kän*, 'used for drinking,' a 'drinking utensil,' or, as Strachey defines it, 'a can or any such like thing to drink in'; a word cognate with Natick *wütämâ'gän* and Abnaki *üdämaⁿ'gän*, a pipe. As is well known, Europeans, in the seventeenth century, spoke of "drinking" tobacco, instead of smoking it, and so did the Indians, and, in some of the Algonquian dialects, "to drink" and "to smoke" are expressed by the same verb. The Virginian word *tomahawk*, which our dictionaries compare with *tä'mähikän* ('axe'), a coradicate, but not cognate word, is formed by the same rule that is given above: *tä'mähä'm*, 'he cuts' (something inanimate), > *tä'mähä'keü*, 'he uses for cutting,' > *tä'mähä'kän* (apocop. to *tä'mähä'k*), 'used for cutting,' a 'cutting utensil.'

² Strachey describes these "secret-aprons," as they have been called, as composed of "long blades of grass or leaves of trees or such like under broad baudricks of leather, which covers them behind and before."

³ Strachey uses this word in an account of a visit which he paid to the squaw of the deposed ruler of Tapehanek.

dialects: > *pû'teu*, 'he (or she) puts on,' > an. adj. *pû'tewû'su*, 'put on'; 'a put-on,' a 'vesture.' Adjectives are often used substantively in Algonquian.

taw (*tâw*), 'in the middle' (root); = Cree *tâw*, = Ojibwe *nâw*, = Abnaki *nâw*, = Narragansett *nâw*, = Lenape *râw*, *lâw*, = Shawnee *lâw*. DERIVATIVES: Tap. **nuttawutindg** (*nĕtâwûtin'dj*), 'my middle finger,' = Cree *ni tâwîtshtsh*, = Ojibwe *nĭn nâwĭnĭ'ndj*, = Lenape *nĕrâwûrĭ'ntsh*, *nĕlâwûlĭ'ntsh*.

tindge (*'tĭndj*), hand, finger, = Ojibwe *'nĭndj*, = Potawatomi, *'nĭntsh*, = Lenape *'rĭntsh*, *'lĭntsh*, (Western) *'lûndj*, = Menomini *'néntsh*, = Nanticoke *'lûntz* = Rap. *'rĭntsh*,¹ = Natick *'nĭtsh*, = Narragansett *'nĭtsh*, = Caniba *'rĕts*, = Penobscot *'litsh*, = Milicite *'lēdj*, = Cree *'tshĭtsh*, *'tshĭtj* (through assibilation, due to assimilation, from an original *'tĭtsh*, or *'tĭtj*, with which compare the nasalized Tap. *'tĭndj*, or *'tĭ"dj*). DERIVATIVES: **meitinge** (*mitĭndj*), 'hand'; **nummeisutteing** (*nĕmĭsĭûti'ndj?*),² my forefinger, lit. 'my betraying (making known) finger'; **nuttawuting** (*nĕtâwûtin'dj*), my second finger, lit. 'my middle finger'; **ohtindge** (*otĭndj*), crab's claw, lit. 'its hand'; **oteingas** (*otĭndjĕs*), glove,³ lit. 'his (or her) little hand'; **uketeqwaiuttindg** (*okĕ'tĕkwĕûtin'dj*), his thumb, lit. 'his big head-finger.'

top, tap (*tâp*), 'alternately,' 'again and again' (root); = Cree *tâp*, = Ojibwe *nâb*, = Nipissing *nâp*, = Caniba *na"p*, = Natick *na"p*, = Lenape *râp*, *lâp*, = Rap. *râp*, = Niantic > *ja"p*. DERIVATIVES: **Topahanoek** (*Tâpĕhâ'nĕk*), 'the stream that ebbs and flows'; a word in which the formative *-hânĕk* is borrowed from another dialect. **uttapaantam** (*tapântâm*, with prosthetic vowel), deer (*Cervus virginianus*), = Rap. *rapântâm*, defined as 'venison.' *Tapântâm* means 'he chews once again,' and distinguishes the deer (the only ruminant with which the Virginia Indians were acquainted) as the 'cud-chewer.'⁴ **tapaantaminais**, a

¹ Found in *nekerinskeps*, 'finger-ring,' a misspelling of *nâ'kĕrĭ'ntshĕpĭsun*, lit. 'hold-finger tie (or band).'

² The root of this word, written simply *mis* (with a long vowel) in the original seems to be the Cree radical *misĭ*, 'to betray,' 'to make known.' There is no other Algonquian root of similar spelling that would make any sense in connection with the name of the index-finger, which, in some dialects, is called the 'pointing finger.'

³ This same metaphor is found in other dialects, as in the word for mitten, which in Caniba is *mĕrĕ'tsĕs*, and in Milicite *mû'ldjĕs*, both meaning 'little hand.' The Ojibwe name for glove or mitten is *mĭndjikâwân*, 'artificial hand.'

⁴ The Algonquians do not, as a general thing, seem to have observed the cud-chewing habit of our native ruminants, and so the words descriptive of the operation are usually of missionary formation. Père Lacombe, for the Cree, has *mâ'mâkwâ'tshikĕpâ'y'iu*, 'he keeps crushing with the teeth.' The word constructed by Eliot was *onchittamau* (*a"tshĭtâ'mĕu*), which, without the suffix *-eu* (which destroys the signification) would mean 'he chews again,' 'he re-chews.'

string of cylindrical copper beads ("bugles").¹ The word is from the root *tap*, 'in alternation,' 'in succession' (on a string), and, apparently, *-ä'n'to* (for *-än'to*), 'strange,' 'mysterious,'² *-mîn*, 'bead,' and the diminutive suffix *-és*.

uttocannoc (*otókänä'k*, for *otótükä'näk*), pl. of *otótükä'n*, a wing, = Prairie Cree *otâtäkwä'n*; but the following Algonquian words for a bird's wing are coradicate with Cree *'tikkógän*, the armpit or axilla:³ Ojibwe *'ningwígän* (< *'nî'ngwi*, armpit), = Miami *'längwä'nâ* (< *'längíngi*, armpit), = Caniba *'rëgwána* (< *'rë'gwi*, armpit), = Shawnee *'lë'kwa*, = Lenape *'rä'nikwän*, *'lä'nikwän*, (Western) *'lä'ngwûn*, = Menomini *'nächka'kwän* (< *'nâ'chki* armpit).

weisqwaput, nu (*nëwiskwepítâu*,⁴ 'I wind (or wrap) him (or her) up'; = Cree *nîwiskwepítâu*, = Lenape *nëwiskwepílâu*, = Natick *nëwiskwepínâu*: < root *wiskw*, 'to wind up,' 'wrap up,' + the animate transitive termination (1st and 2d per.), Cree and Tap. *-pî-tau*, = Lenape *-pî-lau*, *-pî-rau*, = Natick *-pî-nau*, denoting, according to the root (1), the action of 'pulling,' and (2) that of 'tying.'⁵

wintuc, wintuccum (*wintûk*, *wintûkûw*), a ghou!,⁶ = Cree *wit-tikôw*, = Ojibwe *windigô*; in the mythology of the Crees and Ojibwes, a gigantic monster in the form of a man, who feeds upon human flesh.

¹ This "Chayne with long lyncks of copper which they . . . accompt a jolly ornament" is mentioned by Strachey in an account of a visit that he paid to the squaw of the deposed ruler of Tapehanek.

² Copper was naturally a strange material to the Virginia Indians, who prized it very highly, and who doubtless obtained their supply of it indirectly, by barter, from the Lake Superior region. The Virginia name for the metal, *mâtä'ssîn*, meaning 'on a stone,' shows that the first specimens that were exhibited to them were adherent to their rocky matrix. Glass was another mysterious or supernatural substance, and hence the Ojibwe name for a glass bead, *mä'nît ômînê's*, 'mysterious little bead.'

³ They hence correspond to Greek *πτέρυξ*, and Latin *ala*, a 'wing,' with reference to the wing-joint.

⁴ This verb was generally used by the Algonquians with reference to the preparation of a corpse for burial, the preliminary winding it up in mats or skins.

⁵ The particle *-pî*, before the suffix of active transitive verbs of a certain conjugation 'scheme' denotes primarily the action of 'pulling' — an exertion of the *arm*; whence, perhaps, the name of that member, *pî't*, 'the puller.' The Algonquian notion of 'tying' was that of 'pulling together,' as in English, in which, as is well known, the verbs 'to tug' and 'to tie' are from the same base.

⁶ This word is printed 'fool' in the *Dictionarie*, through the misreading, by a copyist, of a word written 'gool' for 'ghoul.' Through like misreadings, we find, as English definitions, 'an otter' for 'another,' 'aunts' for 'ants,' an 'owl' for a 'cove,' 'a rose' for 'he rose,' and a 'crome' for a 'crane.'

CULTIVATION OF "MEDICINE TOBACCO" BY THE CROWS—A PRELIMINARY PAPER

By S. C. SIMMS

The ceremony attending the planting of the "medicine" tobacco plant is one of the oldest observed by the Crow Indians. With slight variation the performance of the ceremony is still observed as in the days when buffalo were plentiful, when, about the beginning of winter, the fattest buffalo cows that could be found were killed and the meat cured so as to keep until the following spring. Just after the killing it was announced that the meat would be eaten at the planting of the tobacco plant. To-day beef is used in lieu of buffalo meat.

As soon as the chokecherry trees begin to blossom in the latter part of May, preparations are begun for a feast. After the feast the following is sung, in a chant-like manner, four times, accompanied by the shaking of a rattle :

" I am going to plant tobacco,
There will be plenty,
Come and see the tobacco."

At the conclusion of the fourth repetition some wild onion, earth from mole hills, and dried cattle manure (formerly buffalo or elk chips were used) are put into bowls and thoroughly mixed ; to this is added a little of the tobacco seed mixed with water, then after another mixing beef offal is added. The largest intestine of the beef has meanwhile been selected and cut into as many pieces as there are members of the party. Each piece of the intestine is then filled with the mixture and the ends tied with sinew ; they are then distributed, each piece fastened to the curved end of a chokecherry stick about three feet long. Each person having one of these sticks is regarded as the offspring of the oldest man in the party, who is alluded to as the "father" and who always conducts the ceremony.

After the distribution of this curious sausage, the personal "medicine charm" of each man is given by him to his wife, or to his nearest female relative present, who suspends it from the middle of a long string, the ends of which cross the shoulders, allowing the medicine to hang down the back. The ends of the string are then grasped in the left hand, which is held across the chest to the right side. In the right hand of each woman is carried a fan consisting of the wing of an eagle. Each woman is dressed in her most attractive costume and wears in her hair an eagle feather.

Directions are given for the forming of a single line abreast, one-half being women and the other half men, and in this form they march to the tobacco planting grounds. This line, which consists of both married and single men and women, is headed by a woman, usually the wife of the old man alluded to as the "father," but if she be not living the nearest female relative of the old man is chosen. The leader always carries a bundle of small branches of the chokecherry tree, to which are tied small stuffed birds.

This march is always at a slow pace in the direction of a mountain to the south (as a crane flies in the fall), and is accompanied with singing, drum-beating, and rattle-shaking. At a distance of about four hundred yards from the beginning of the march the leader stops suddenly and sits on the ground, in which he is followed by the others. As soon as all are seated the old man fills a pipe with tobacco, and after lighting it points it stemward to the sun and then to the earth. This he repeats slowly and deliberately four times, with the invocation at each movement, "May the tobacco grow very tall." He then passes the pipe to the next man in line, and so on down the line, but omitting the women. Sometimes a man may be afraid to smoke the pipe for fear that, if the tobacco should not grow, some great harm would befall him; but if he is not afraid to smoke, and desires to do so, he grasps the pipe-stem firmly with both hands and takes as many inhalations as he desires; and as he smokes, the remainder of the men exclaim, *Ah-ho!* which signifies "Thank you!" This act of smoking is regarded as a ceremonial equivalent to the sacrifice of the life of the smoker that the tobacco plant may grow.

After all the men have smoked the pipe, the "father" sings

a song which is taken up by the others, who also accompany their leader with their drums and rattles. During this song the women dance, which they continue after the men have ceased singing and playing. As the women dance they sing :

“ I walk toward the mountain ;
I am the last one.”

This song is repeated four times, and at its conclusion the march is resumed in the same order as before, a stop being made about four hundred yards from the first stop, where everything is repeated exactly as when the participants halted on their outward march.

This marching, halting, smoking, praying, singing, and dancing are repeated twice more, or four times in all, the last stop taking place about a hundred yards from the tobacco planting grounds. During this last stop the women transfer the chokecherry sticks and the medicine from their backs to young men, usually their relatives, whereupon the latter form in line abreast and the “father” sings the following song four times :

“ I am going to make tobacco,
There will be plenty ;
Come and see the tobacco.”

At the conclusion of the fourth song the young men who have been standing in line engage in a foot-race to the planting ground, on reaching which each one hangs his medicine and chokecherry sticks on branches of trees which had previously been placed upright around the planting ground. The young man first reaching the goal is prayed for that he may have a successful future and especially no ill-luck during the ensuing year. No prayer, however, is offered in behalf of the losers of the race, who are ridiculed instead. The one who first succeeds in hanging up the medicine and the stick prays for that which he desires most.

At the conclusion of the race the entire party advances and begins the construction of a hedge of green branches around the planting ground, which has already been partially and uncereemoniously prepared for the planting. As soon as the hedge is completed, the women work the soil as fine as possible by hoeing and

raking ; the men and women then stand in pairs, usually man and wife together. The tobacco, which is tied up in the intestine, is next taken off the curved chokecherry stick and held in the left hand, while the stick is grasped by the right hand. The "father" now sings the following four times :

" I am going to make tobacco,
There will be plenty ;
Come and see the tobacco."

When the song has been repeated the fourth time, those holding the tobacco and sticks move forward in a row upon the planting ground, and each with the end of his stick makes in the ground a hole about the size of a man's index finger and about four inches deep. The holes are made in rows. The filled piece of intestine is laid across the left arm, and with the right hand a small quantity of the mixture of tobacco and fertilizer which it contains is placed in each of the holes, which are then filled with earth.

When the planting has been finished a large sweat-lodge of bent boughs is erected, sufficiently large to accommodate ten or twelve men. This number enter the lodge and repeat, four times, the following song :

" Say, man, we are going to make a sweat-house."

The men remain in the lodge for about twenty minutes, when they rush to the river and take a plunge. After thus cleansing themselves they take a number of small willow branches and cover them with grease and charcoal ; their ends are then stuck in the earth, in a corner of the planting ground, in such manner as to form the framework of a miniature sweat-lodge, in the center of which are put live coals of fire. From the mountains has previously been obtained a root called "bear-root," which is chipped and placed upon the fire ; but before this is done the root is held by the "father" in his right hand, which he extends successively toward the east, the south, the west, and the north, facing the east all the time, so that when the hand is extended to the west it is necessarily passed over and back of his head, and when extended to the north it is also over the

head. From this last position the "father" lowers the root with a spiral movement (as a crane alights) toward the fire. This is done four times, each time the hand becoming nearer the fire, until, on its fourth descent, the chipped root is placed upon the fire.

As the incense arises sunward a pipe is filled and lighted by the "father," who sends the first whiff toward the sun, at the same time pointing the stem thereto and praying that the people may live long. The next whiff is blown toward the east, the "father" at the same time pointing the stem of the pipe downward and praying that the people may have no sickness. If the smoke from the burning bear-root rises straight, prayerful petitions are made that the tobacco plant may grow as straight as the smoke, and that the participants and the whole tribe may have no misfortune.

The ceremonies of the day close with a great feast outside the planting ground.

Every seventh day after the planting the older men go to see how the plants are thriving, and as soon as the sprouts appear they return to the camp, singing songs of thanksgiving.

Although the tobacco tract may become overgrown with weeds, no one ever enters the enclosure until the wild plums are ripe; then the medicine tobacco is gathered — roots, stalks, and leaves. As the plant is considered to be poisonous, those who harvest it rub their hands beforehand with a root gathered in the mountains. No ceremony is observed when the medicine tobacco is gathered.

The plant is stored away, and when dry the seeds are put in a buckskin pouch and kept for another planting. The roots, stalks, and leaves are thrown in the river.

BOOK REVIEWS

Die Vorgeschichte des Menschen. Von G. SCHWALBE. *Mit einer Figurentafel.* Braunschweig: Friedrich Vieweg und Sohn, 1904. 8°, 52 pp.

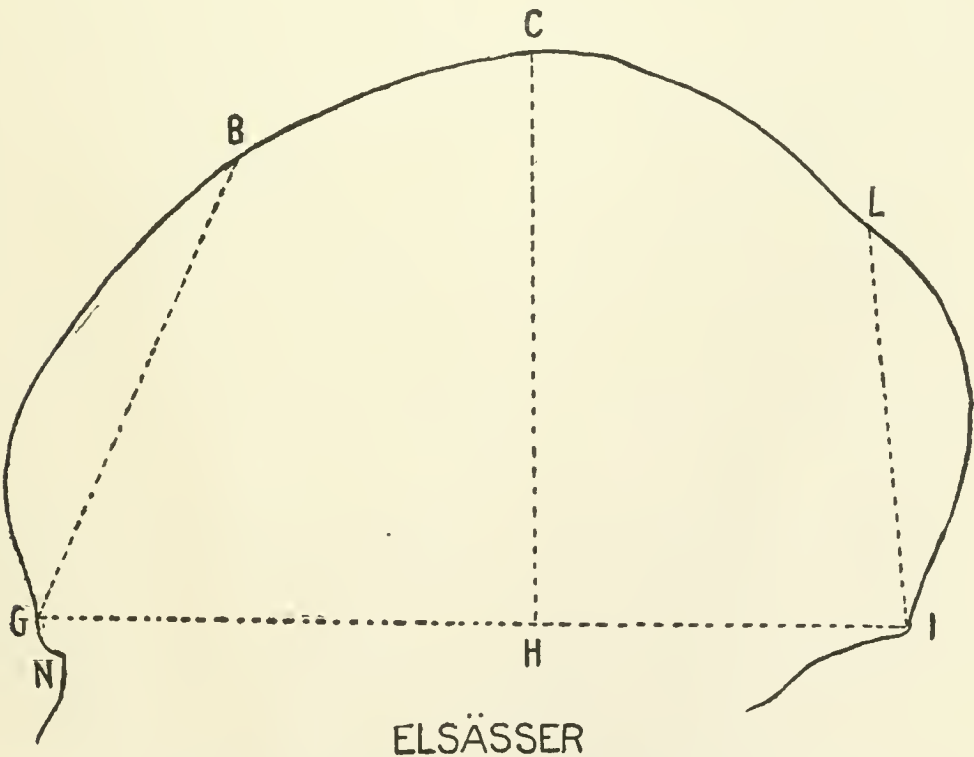
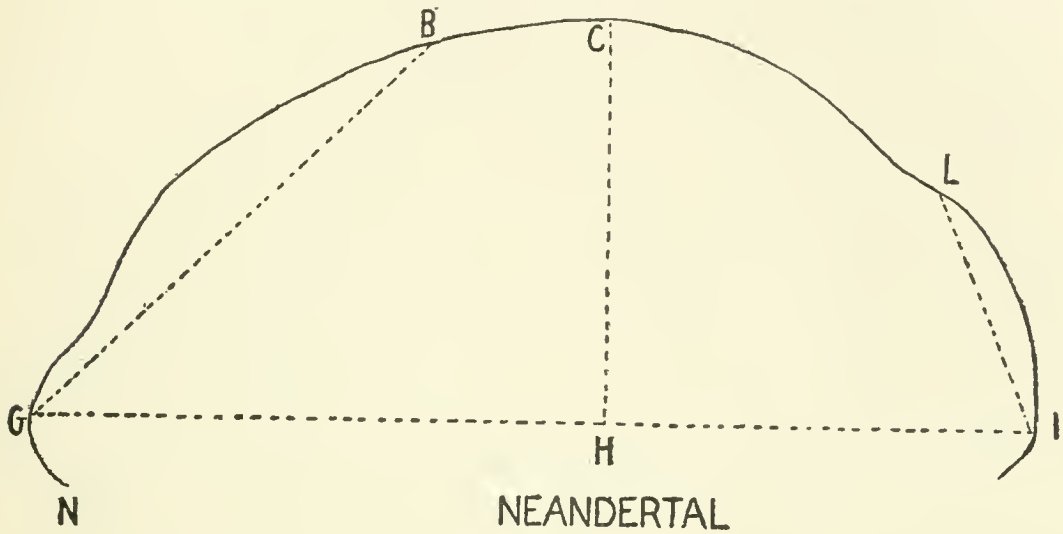
Professor Schwalbe's recent papers on the prehistoric races of Europe, as well as on *Pithecanthropus erectus*, have been received with general favor. Few living writers are so well prepared to treat the subject from the anatomical standpoint.

Schwalbe recognizes that there are at least two types of Paleolithic man, and proceeds to devote his attention to the oldest and most primitive one, viz., that of which the remains from Neandertal and Spy are representative. Various names have been proposed for this early race, as Neandertal, Spy, and Canstatt, the latter being the choice of de Quatrefages and Hamy. King, an Irish writer, considered diluvial man as a species apart, to which he applied the name *Homo Neandertalensis*. Sir John Evans has suggested *Homo incipiens* as opposed to *sapiens*. Schwalbe prefers the appellation *Homo primigenius* to all others, thus recognizing with King that specific differences separate this early type from all succeeding human types, as well as from the apes. These differences are made strikingly evident by comparison of the cranial caps in Macacus, Chimpanzee, Pithecanthropus, Neandertal, and a modern Alsatian. The reviewer reproduces (figs. 4, 5) the last two figures used by Schwalbe.

The profile curve from the nasion (N) to the inion (I) brings out the relative flatness of the Neandertal skull. From c, the highest point of the skull, line CH is drawn perpendicular to line GI, which connects the glabella with the inion. The ratio of CH to GI is much greater in the modern races than in the Neandertal, being 40.4 in the latter and 52 in the lowest types of recent man. Another striking difference is the retreating forehead of *Homo primigenius*. This may be determined by measuring the angle which the straight line drawn from bregma (B) to glabella makes with the base-line GI. In the Neandertal skull the angle BGI is only 44°, while in *Homo sapiens* it never falls below 55°. The lambda angle LIG measures from 78° to 85° in recent man, while it is only 66° in the Neandertal specimen.

An increase in the size of the bregma- and lambda-angles would of course mean a marked increase in the length of the medial, cranial curve GBCLI. In respect to the relative length of this curve the Neandertal skull

resembles the ape skull more closely than it does that of recent man. In the latter, the median curve is greater than any curve not in a median line, and connecting the glabella with the inion. In the apes and the



FIGS. 4, 5.—Comparison of the Neandertal cranial cap with that of a modern Alsatian.

Neandertal race, the median curve is shorter than the curve passing over the upper margin of the temporal bone (*Schläfenbeinrand*). These two curves on the Neandertal skull are of about equal length. The discovery

of two almost complete diluvial skeletons in a cavern at Spy, Belgium, has made it possible to compare the face- and jaw-bones, as well as the extremities of this race, with those of living races. But the specific differences are not so great in the long-bones as in cranium and lower jaw. These differences alone are sufficient to separate early diluvial man specifically from all succeeding races and to justify, in the opinion of Schwalbe, the name *Homo primigenius*.

From the species *Homo primigenius*, Schwalbe excludes the skull fragments of Egisheim, Tilbury, Denise, Brünn, Predmost, and some others. But the human remains recently taken from a Krapina rock-shelter in Croatia, he classes with those of Neandertal, Spy, La Naulette, Arcy, Malarnaud, Schipka, and Taubach. The remains of *Homo primigenius* have thus far been found only in Europe. The Calaveras and Lansing skulls have nothing in common with the primigenius type.

Osteological remains of an earlier human race than the Neandertal (*Homo primigenius*) have not yet been found. But there are evidences sufficient to prove to the satisfaction of many observers, the presence in Europe of a Tertiary, tool-using progenitor of man. In this connection, special importance attaches to the remains of *Pithecanthropus erectus*, found by Eugène Dubois, near Trinil, Java.

In his comparison of man with living and fossil apes, the author concludes that all the links in the phylogenetic chain connecting *Dryopithecus fontani* (Miocene) with *Homo primigenius* (Quaternary) have not yet been discovered. The chief physical differences are due to the erect posture and the consequent cerebral development. Cunningham's recent investigations of right- and left-handedness show distinctly that the differentiation of the human hand antedates the formation of the center of articulate speech.

The changes in the lower extremities must have kept pace with those of the upper; so that one is not surprised to find *Pithecanthropus erectus* with a femur resembling closely that of man, but with a skull rather like that of the anthropoids. The biped series, then, begins with *Pithecanthropus* and the Pliocene period. It is, however, not necessary to suppose that *Homo primigenius* of the lower Quaternary is in the direct line of descent from *Pithecanthropus*. A contemporary of the latter would answer every purpose as progenitor of man.

Schwalbe's chief contribution to the literature on this subject is in calling attention to the line of cleavage separating the early Paleolithic race from *Homo sapiens* which first appeared in later Paleolithic times and to which belong all subsequent races, both prehistoric and historic.

GEORGE GRANT MACCURDY.

Islands Kultur ved Aarhundredskiftet 1900. Af VALTÝR GUÐMUNDSSON.
Copenhagen : 1902. 8°, viii, 160 pp.

To the student of anthropology undoubtedly the most interesting part of this volume on "The Civilization of Iceland at the beginning of the 20th Century" is the chapter which discusses the physical type and the mental characteristics of the modern Icelander. The Icelanders, being Scandinavians, belong ethnologically to the Nordic or Xanthochroid race of northern Europe. Physically he is most often long-skulled, has fair hair and blue eyes, but is only of medium height, being, therefore, in this respect unlike Continental Scandinavians, especially the Norwegians and the Swedes, who are among the tallest of peoples, measuring according to Keane 1.713 meters. There is, however, another type of modern Icelander, a black-haired, round-faced type, which is thus, in prominent physical characteristics, the very opposite of the prevailing type. Mentally he is also very different. Guðmundsson's characterization of the prevailing type is in brief this: Physically he is only slightly above medium height, and is inclined to be slender; he has a shorter and a weaker frame than his Norse ancestor. He is generally blond, has blue or gray eyes, and a narrow, long face. He is extremely independent, has no respect for authority, does not find it easy to subject himself to the leadership of another — he is oppositional. In politics he is a democrat, who advocates to the last extreme the rights of the individual. He is a friend of progress and has an unbounded love of liberty. In religion he is a rationalist; he is a stranger to pietism and intolerance, — there never was a pietistic movement in Iceland. He is a man of reason, and demands absolute freedom for one's personal convictions. He knows no class distinctions, and is apt to regard it as a mere accident if he is socially below the one he may happen to have to do with. He is sanguine, he is changeable. He is not practical. He is an optimistic idealist and is therefore apt to overrate his ability; but if disappointed he is not discouraged, but reconciles himself to circumstances and begins anew. So far the sanguine element is the predominant one. Then there is the opposite type. Those who belong here are generally melancholy of temperament and are characterized by very strong feelings, are constant, oppose change, look with disfavor on new movements, and are conservative. They are pessimistic, easily discouraged, suspicious, jealous of those who are better placed than they. They live for the moment, cannot plan for the future, rarely assert themselves against others, but follow the majority. Politically their interests are local; they regard the state as the means for individual betterment, the

country as a whole they care little for. In contradiction to the general characteristics of the prevailing type, lack of thrift is said to be a common Icelandic trait.

The explanation for these two opposite types Dr Guðmundsson finds partly in environment, partly in heredity. The Icelander has always lived in unhappy conditions ; he has been fostered in a severe nature. These environmental influences must have been strong ; they have undoubtedly helped powerfully to stamp his character in a way far different from that of his Norse brother, much better circumstanced. Racially the Icelander is a composite character, and the two types in the modern population will find their chief explanation in the different racial elements of which the original colonists in the ninth and tenth centuries were composed. It is therefore a most interesting case of the perseverance of type in a small number of the population surrounded by a much larger class of radically different characteristics. It will be remembered that Iceland was peopled, between 870-930, chiefly by colonists from western and southwestern Norway. Norwegian Vikings had made western voyages already long before this. The Shetlands, the Orkneys, northern Scotland, the Western Isles, Man, large parts of Ireland, and northern England had been visited by them. Extensive settlements had been made, especially in Ireland and the Western Isles. The Norse Kingdom of Olaf the Fair in Dublin dates back to 851. Between these various settlements there was considerable internal migration of Norse colonists, e. g., from Ireland to northwestern England ; from the Western Isles to Scotland ; from Ireland to Scotland, the Faroes, and elsewhere ; and from all these to Iceland, which was settled last. While Iceland was colonized largely by Norsemen from Norway, it is well known that Norse colonies in the west contributed in no small measure to the early population. The *Book of Settlement* and the family sagas contain numerous Celtic names, although these can by no means always be taken as evidence of Celtic descent. The Norsemen from the Celtic West took with them their thralls and bondmen, and these were frequently given their freedom and provided with land by their masters. These different racial elements have developed an Icelandic character differing in many respects from that of the purer Teuton of the Scandinavian countries. The prevailing type has been modified ; the elements that predominate in this type, however, are the Norse-Germanic. They are in race chiefly the descendants of Vikings who would not submit to Harald Fairhair's rule, but left Norway and found a home for themselves in Iceland where they could be their own masters. Their most prominent trait is extreme independence. The sanguine ele-

ment is predominant. The second type is in a larger degree the descendant of the thrall. In contrast to the self-assertiveness of the former stand the submissiveness and the lack of confidence in self of the latter. But the thrall was not of one single race. For the greater part, perhaps, he was the Celt, made slave by the Viking invaders. But many colonists from Norway seem, as Dr Guðmundsson points out, to have brought with them thralls of a non-Aryan race — descendants of a pre-Scandinavian people in Norway. The Iclander's composite character finds its explanation largely in his racial origin. Environmental influences — social, political, and economic — have, however, also played an important part.

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Explorations of the Gartner Mound and Village Site. By WILLIAM C. MILLS (*Curator, Ohio State Archaeological and Historical Society*). Reprint from the *Ohio Archaeological and Historical Quarterly*, Volume XIII, Number 2. Columbus: 1904. 4°, 65 pp., illustrated.

The Gartner mound is six miles north of Chillicothe, Ohio, on the eastern side of Scioto river, seventy feet above low-water mark; it is seven feet six inches high and seventy-five feet in diameter.

Among the most interesting features described in connection with this mound is the novel series of pits and graves dug below the original surface of the ground and originally covered with three smaller mounds, which in turn were subsequently consolidated into a single mound by the heaping up of earth over all three.

Numerous human skeletons were unearthed, many having objects buried with them, others apparently having none. Several of the objects, both ornamental and domestic, are of the ordinary sorts, while others are unique; they consist of bone, stone, pottery, and shell. Refuse heaps of ashes and of bivalves were also encountered. Much information is given in relation to the daily life of the people who constructed this mound and lived on the adjacent village site. The bones of the animals identified are those of the ordinary wild beasts of the recent period; the author also found indications of the presence of the domestic dog.

Bone awls, scrapers, and fish-hooks in every stage of manufacture were discovered, not only in the mound but on the village site.

The author claims to have found undoubted evidences of cremation in the ash-pits, which contained half-charred human bones. With the burials were found perforated crescents made from sea-shells, as well as the bored teeth of the dog, raccoon, wolf, bear, and elk. A unique

awl of bone, with a head carved upon it, is described, as is also a flat-base mound pipe of sandstone. A complete earthenware bowl decorated with a scroll pattern was also unearthed with one of the skeletons. The stone implements found in the mound and on the adjacent village site are of the usual type, and were evidently made by the same people in each instance. Arrowpoints of bone, with cavities bored in them for the socketing of the shaft, are of novel occurrence; for although bone arrowpoints are often mentioned by early writers, this type has heretofore been unknown.

A deposit of mussels, called by the author a "bake," is interestingly described, as is the manner of cooking these bivalves.

The author claims that the pits in Paint Creek valley, of which there are many, were originally intended for the storage of grain, beans, and nuts; they are believed to have been dug in the spring and to have been lined with straw or bark for the reception of the fall crop. In the refuse in many of these pits charred corn and corn-cobs were found. The same method of caching food was observed by Lewis and Clark during their journey up the Missouri.

The monograph is a valuable contribution to American archeology, and the author is entitled to great credit for the manner in which his material is presented.¹

JOSEPH D. MCGUIRE.

¹ A selection from the remarkable collections made by Professor Mills in the Gartner mound and in other mounds and village sites in Ohio during the last two or three years, forms a noteworthy feature of the exhibit made by the Department of Anthropology and Ethnology of the Louisiana Purchase Exposition at St. Louis.—*Editor*.

PERIODICAL LITERATURE

CONDUCTED BY DR ALEXANDER F. CHAMBERLAIN

[NOTE.—Authors, especially those whose articles appear in journals and other serials not entirely devoted to anthropology, will greatly aid this department of the *American Anthropologist* by sending direct to Dr A. F. Chamberlain, Clark University, Worcester, Massachusetts, U. S. A., reprints or copies of such studies as they may desire to have noticed in these pages. — EDITOR.]

GENERAL

Anthony (R.) Contribution à l'étude de la morphogénie du crâne. (Bull. Soc. d'Anthr. de Paris, 1903, v^e s., IV, 579–580.) Unlike man, the carnivora (dog) with strongly developed masticatory apparatus show a crotaphyte muscle which is an obstacle to brain evolution.

Azoulay (L.) Musées et collections phonographiques en France. (Ibid., 536.) Brief note recording the fact that the fine-arts section of the Celtic Congress possesses more than 900 original melodies on phonographic cylinders.

— L'épreuve linguistique comme moyen d'identification des individus soumis aux recherches scientifiques. (Ibid., 565–568.) Author argues for a "linguistic test," or scientific shibboleth, to guard against mistakes in the record of linguistic data given by individuals, — e. g. a man claiming to be from Accra was proved to be a Fanti.

Barnhill (J. U.) The development of obstetric surgery. (Columb. Med. J., Columbus, O., 1903, repr. 1–16.) Treats of obstetrics among ancient Egyptians, Jews, Greeks, Hindus, Romans; and modern European peoples during the last three centuries. Instruments, operations, etc., are historically considered.

Bartels (P.) Ueber Vergleichbarkeit kranimetrischer Reihen. (Z. f. Ethnol., Leipzig, 1903, xxxv, 935–951.) Technical discussion of the possibility of measuring and numerically expressing the "anthropological utility" of cranio-metric series, based chiefly on Ranke's and Koganei's material. The "index of utility" is the percentage of the middle number to the range of variation.

Bucke (W. F.) Cyno-psychoses. (Pedag. Sem., Worcester, 1903, x, 459–513.) Treats of children's thoughts, reactions, and feelings toward pet-dogs, data from *questionnaires*. Contains also ethnographic material from various sources. Bibliography of 113 titles. Author thinks dog was first "an economic assistant in life's struggles."

Chamberlain (A. F.) Primitive woman as poet. (J. Amer. Folk-Lore, Boston, 1903, xvi, 205–221.) Treats of poetic activities of woman among primitive peoples of all parts of the globe, also among the various nations of Europe in their primitive aspects. The American Indians and the Negroes receive special attention.

— Legal folk-lore of children. (Ibid., 280.) Résumés first part of A. de Cock's *Rechtshandlingen bij de Kinderen*, in *Volkskunde*, 1902–1903, xv, 193–199.

Colella (R.) Linguaggio e cervello. (Ann. d. Clin. d. Mal. ment. e nerv., Palermo, 1903, 1900–1902 [1903], II, 127–168.) General discussion of facts concerning the evolution of language and the human brain. The primal psychological fact is *sensation*, then *association*. The cerebral cortex is by no means uniform in function. Language offers us clear proofs of man's becoming and perfection.

Czekanowski (J.) Zur Höhenmessung des Schädels. (A. f. Anthr., Brnschw., 1904, N. F. I, 254–258.) Technical discussion, with tables of measurement, of various "heights" — 21 heights from basion, opisthion, ear-heights, etc., according to numerous authorities. The author measured 50 Disentis skulls to determine the relative value of these heights, and concludes that the best

suitied for the study of craniological type are the bregma-basion and the vertical ear-height.

Dwight (T.) A separate subcapitatum in both hands. (*Anat. Anz.*, Jena, 1904, XXIV, 253-255, 1 fig.) Brief account of subcapitatum, corresponding to "Pfitzner's prophetic description."

Fehlinger (H.) Zunahme der Krebserkrankungen. (*Naturw. Wohnschr.*, Jena, 1903, XVIII, 546-547.) Discusses cancer-statistics of U. S. Twelfth Census and those of Hamburg as considered by Dr Fuld at pages 404-405. An increase of cancer-mortality seems to mean a decrease in tuberculosis-mortality. In the U. S. urban mortality is not greater than rural, vice versa in Hamburg. After the 45th year, the white race suffers more than the others, before it less.

— Die Sterblichkeit der europäischen und der Neger-Rasse. (*Ibid.*, 1904, XIX, 280-281.) Discusses U. S. Census statistics; author attributes greater negro mortality to the smaller vitality of the race.

Fischer (E.) Zur vergleichenden Osteologie der menschlichen Vorderarmknochen. (*Corr.-Bl. d. deutschen Ges. f. Anthr.*, München, 1903, XXXIV, 165-170, 2 figs., tables.) Comparative study of the bones of the forearm in Europeans, primitive races, anthropoids. The curve of the radius, Dr Fischer shows is, as Klaatsch declared, "an ancient primate-inheritance," — the Neanderthal radius falls within the human range of variation. The Neanderthal ulna, however, preserves the olecranon-cup, which has almost entirely disappeared in the present races of man.

Görke (O.) Beitrag zur funktionellen Gestaltung des Schädels bei den Anthropomorphen und Menschen durch Untersuchung mit Röntgenstrahlen. (*A. f. Anthr.*, Brnschw., 1903, N. F. I, 91-108, 2 pl., 2 figs.) Gives results of investigations with X-rays of anthropoid and human skulls in the Selenka collection in München as to relation of face and cranium, functional changes in skull, effect of teeth on surrounding bony structure, effect of lower jaw pressure, etc. Author concludes that both internally and externally the skull is influenced by function (especially mastication), resulting in difference between man and the anthropoids.

de la Grasserie (R.) De la sexualité chez les divinités. (*R. de l'Hist. d. Relig.*, Paris, 1903, XLVIII, 48-67.) In the matter of sexuality of deities evolution is from non-sexuality (in a certain sense in man also) to anthropomorphism, preceded and prepared for by animism, and sexuality. Under the influence of anthropomorphic imitation various religions have made much of sexuality — the gods imitate man even in his genic excesses. Christianity has converted the primitive triad into a trinity; instead of continuing to imitate the body, it has imitated the mind. In the case of the Virgin, maternity was preserved with the elimination of sexuality. Ultimately asexuality was reached.

Hahn (E.) Entstehung des Getreidebaues. (*Z. f. Ethnol.*, Leipzig, 1903, XXXV, 1903, 1007-1019.) Author traces origin of agriculture to ancient Babylon — "agriculture and irrigation have always gone hand in hand." Hahn does not refer to McGee's writings on this topic.

Headlam (A. C.) Early Christianity and archeology. (*Rec. of Past, Wash.*, 1903, II, 372-376.) Discusses the debt of New Testament interpretation to archeology.

Hill-Tout (C.) Totemism, a consideration of its origin and import. (*Trans. R. Soc. Can.*, Ottawa, 1903-1904, II. S., IX, 61-99.) After giving a brief statement of "what is regarded by leading American students [Powell, Fletcher, Cushing, Boas, *et al.*] as the doctrine of totemism," the author discusses recent views of Tylor, Lang, Frazer, Haddon, *et al.*, and sets forth his own opinion that "the personal totem undoubtedly *does* give rise to the family and group totem." He opposes Lang's "nick-name theory." Differences between "totems" and "fetishes" lie mainly in the way in which they are severally acquired.

Holl (Prof.) Der Schädel Hamerlings. (*A. f. Anthr.*, Brnschw., 1902-1903, XXVII, 259-275, 4 figs., tables.) Detailed description of the skull of the poet Hamerling, with references to those of Schiller, Kant, Bach. An extraordinary development of the bregmatic region is noted.

Krause (E.) Die Verwendung von kohlensaurem Ammoniak und Chlorammonium bei der Konservierung von Eisenaltertümern. (*Z. f. Ethnol.*, Ber-

- lin, 1903, xxxv, 791-793.) Author believes he has at last discovered an electrolytic bath highly preservative of iron objects against chemical injury.
- Laufer (R.)** L'addition du sel aux aliments est-elle nécessaire? (Rev. Scientif., Paris, 1904, v^e, s, 1, 455-460, 489-493.) Contains some data on use of salt by various peoples. Author concludes that use of salt with foods is not absolutely necessary, as they contain largely what is needed in themselves.
- Lickey (J. D.)** On the relations of the seventh and eighth ribs to the sternum in man. (Anat. Anz., Jena, 1904, xxiv, 326-332.) Based on examination of 51 adult sterna in the dissecting room of University College, Dundee. The eighth rib in man is a degenerated sternal rib, and the seventh is becoming such.
- Loria (G.)** Encore les femmes mathématiciennes. (Rev. Scientif., Paris, 1904, v^e s., 1, 338-340.) Reply to Mlle. Joteyko. See *American Anthropologist*, 1903, N. S., v, 164.
- Macnamara (N. C.)** Kraniologischer Beweis für die Stellung des Menschen in der Natur. (A. f. Anthr., Brnschw., 1902-1903, xxvii, 349-360, 4 figs.) Discusses changes in skull conformation and capacity, from the anthropoid apes, past the Pithecanthropus of Java, the Neanderthal man, to the Galley Hill and Tilbury types and the living races. Progress results from inborn growth capacity, race-mixture, and long-continued influence of environment. The skull, not the skeleton, has developed in recent man.
- Mason (O. T.)** The past is in the present. (Rec. of Past, Wash., 1903, ii, 332-335). Treats of the ethnologist, the historian, the archeologist, the paleographer, the philologist, the sociologist, the folklorist, the craftsman, and the religionist as guides in the study of the "awful conservatism of mankind,"—the part of human activity is seen in the present in four forms: decaying, vestigial, surviving, and vitalizing.
- Michel (R.)** Eine neue Methode zur Untersuchung langer Knochen und ihre Anwendung auf das Femur. (A. f. Anthr., Brnschw., 1903, N. F., I, 109-122, 6 pl., 7 figs.) Describes a new method of determining and explaining mechanically the form of the long-bones (the femur in detail) by means of the observation and measuring of a series of cross-cuts. Femurs of man (adults, children), the race of Neanderthal and Spy, orang, gorilla, hylobates, indri, etc., are treated of and measurements given. Sections of the femora of Neanderthal and Spy show figures like those of modern man. Those of children in the lower parts resemble those of the gorilla and orang.
- Newell (W. W.)** Sources of Shakespeare's "Tempest." (J. Amer. Folk-Lore, Boston, 1903, xv, 234-257.) A valuable comparative and critical study of the "Tempest" in relation to such possible folk-lore sources of the "bird-wife" type. The contemporary German drama, *Die Schöne Sidea*, by Jacob Ayer, is also considered. Mr Newell concludes that "with the English poet, the *märchen*, received through literary mediation and pared to the vanishing point, served merely as a peg on which to hang golden fruit."
- In Memoriam—Henry Carrington Bolton. (Ibid., 275.) Brief record of life and scientific activities, with list of chief works.
- Petsch (R.)** Volksdichtung und volkstümliches Denken. (Hess. Bl. f. Volksk., Leipzig, 1903, ii, 192-211.) Discusses the nature and relationship of folk-song and folk-thought. Imagination, content, form, combination, analogy, "monarchism," pessimism, love, extreme tendencies, emotion, feeling, sensualism, etc., are considered. For the author: "Folk-song is only that poetry which the philosophy of the common man is able to express in his own language and by such means as exert a special influence upon him." The question of folk-song is one with that of folk-thought.
- Pinto (C.)** O antigo imperialismo português e as leis modernas de governo colonial. (Bol. d. Soc. d. Geogr. de Lisboa, 1903, xx, 209-297.) General discussion of the Portuguese imperial policy. Author seeks to show that the imperialistic ideas of d'Albuquerque are the political type after which have been molded the modern principles of good colonial administration.
- Popowsky (J.)** Contribution à la morphologie de l'artère saphène chez l'homme. (Bull. Soc. d'Anthr. de Paris, 1903, v^e, s, iv, 596-607, 6 figs.) Notes case of saphenous artery in man a

Tomsk in 1902,—the first occurrence was recorded by Zagorsky in 1829. Phylogenetic data are discussed.

Preuss (K. T.) Religionen der Naturvölker, 1902-1903. (Arch. f. Religw., Leipzig, 1904, VII, 232-263.) Useful critical résumés of books and articles printed in 1902-1903 on the religions of primitive peoples,—General, North America, Mexico and Central America, South America. Works of Hewitt, Matthews, Schurtz, Culin, Bogoras, Boas, Dorsey, Dixon, Fletcher, Mooney, Fewkes, León, Kroeber, Lumholtz, Seler, Maler, Gann, Bässler, etc., are noticed.

Ranke (J.) Ueber Hirnmessung und Hirnhorizontale. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 161-163.) Treats of brain-axis (human brains must be measured differently from those of animals), questions to be investigated, technique of measurement, hardening of brain, casts of skull, etc. At the suggestion of Dr Ranke a committee on the anthropological study of the brain was appointed.

Robin (P.) Projet de questions à adresser aux sujets photographiques. (Bull. Soc. d'Anthr. de Paris, 1903, v^e s., IV, 546.) Brief list of questions for data concerning persons photographed.

Sanielevici (Dr) Le travail de la mastication est la cause de la brachycéphalie. (Ibid., 593-595.) Against Nyström, the author considers dolichocephaly the norm and brachycephaly (in the Mongol) the variation or abnormality, produced by the process of mastication exaggerated in a normal race of the Asiatic steppes. Dr Sanielevici assumes, without right, that all Mongols are broad-heads.

Sclavunos (G.) Ueber die Ventrikularsäcke des Kehlkopfes bei erwachsenen und neugeborenen Menschen sowie bei einigen Affen. (Anat. Anz., Jena, 1904, XXIV, 511-523, 12 figs.) Résumés the author's detailed study published in the *Epeteris* of the University of Athens for 1903. Dr Sclavunos found 3 cases of the ventricular sack in 500 corpses of adults. Their presence in the older anthropoids he considers partly due to the need for temperature—protection.

v. Sebestyén (G.) Ursprung der Boustrophedonschrift. (Z. f. Ethnol., Berlin, 1903, XXV, 755-771, 12 figs.) Author holds the score-stick to be the oldest

writing material, cutting into soft wood covering before scratching into stone or metal. The Mediterranean alphabet was originally "notch-writing" (examples of this, particularly from the East Siberian Ostiaks). The ancient boustrophedon is "merely a notch-writing indirectly preserved to the present time." The notch-writing was later copied on stone and other material.

Seggel (Dr) Ueber das Verhältnis von Schädel und Gehirnentwicklung zum Längenwachsthum des Körpers. (A. f. Anthr., Brnschw., 1903, N. F., I, 1-25, 2 figs., curves, tables.) Discusses growth in height, pupil-distance (base-line), relation of stature-growth to pupil-distance, of pupil-distance to skull and brain. Dr Seggel concludes that the measurement of the base-line affords a certain criterion for the development of the frontal lobes of the cerebrum and so for the development of the intellectual faculties. The absence of a base-line adequately corresponding to the growth in stature, or exceeding this (the danger period is from the thirteenth to the seventeenth year), indicates that intellectual pressure must be avoided.

Smith (G. E.) The morphology of the occipital region of the cerebral hemisphere in man and the apes. (Anat. Anz., Jena, 1904, XXIV, 436-451, 9 figs.) Based on some 400 human and 400 simian hemispheres. The non-homology in man and ape and of the "calcarine" sulci is shown. The results of Dr Smith's investigations will appear in detail in vol. II of *Records of the Egyptian School of Medicine*.

— Note on the so-called "transitory fissures" of the human brain, with special reference to Bischoff's "Fissura perpendicularis externa." (Ibid., 216-220, 2 figs.) From examination of fetal brain, author concludes that "the so-called 'transitory fissures' are merely indentations which are produced post-mortem."

Stratz (C. H.) Der Werth der Lendengegend für anthropologische und obstetrische Messungen. (A. f. Anthr., Brnschw., 1902-1903, XXVII, 117-128, 4 pl., 15 figs.) Compares the sexes and discusses normal variations in particular,—based on special study of 20 women and men. The *Kreuzgrübchen* is more marked in women, and the level of the region deeper.

Stratz den Haag (C. H.) *Das Problem der Rasseneinteilung der Menschheit.* (Ibid., 1903, N. F., I, 189-200, 1 fig., map.) Discusses the division of mankind into races, with reference to theories of Fritsch, Klaatsch, *et al.* Stratz holds that the earliest form of man was closely related to the aboriginal Australians; from this type developed the white, the yellow being the youngest of the three great races. The Negrito is a combination of the black and the yellow. The marks of the so-called "protomorphic" races are treated with some detail.

Toldt (C.) *Ueber die äussere Körperform zwei verschieden grosser Embryonen von Macacus cyno.* (Ibid., 1903, XXVI, 277-287, 2 figs.) Details of description and measurement, comparison with those of Deniker and Duckworth. Macaque foetus nearer to human than to gorilla, exhibits same striking differences as between human and gorilla; macaque facially more like human.

von Ujfalvy (C.) *Ziele und Aufgaben meiner Forschungen auf dem Gebiete der historischen Anthropologie.* (Ibid., 26-29.) Résumés his iconographic-anthropological investigations in relation to the "Aryan question" and the works of the "Gobinean school," Reibmayr, H. Chamberlain, Zaborowski, Ammon, Wilser, Penka, *et al.* The author sees "a deep gulf" between the Hindus and Iranians,—today they are racially different. The primitive Aryan of Ujfalvy is tall, blond, blue-eyed, light-skinned, leptoprosopic, and leptorrhine.

Virchow (H.) *Die Verwendung von Abgüssen bei der Herstellung von Skelettpräparaten.* (Z. f. Ethnol., Berlin, 1903, XXXV, 793-796.) From twenty year's experience as an anatomist, the author argues for the use of casts in the setting up of skeletons, *e. g.*, of the foot.

Weidenreich (F.) *Die Bildung des Kinnes und seine angebliche Beziehung zur Sprache.* Anat. Anz., Jena, 1904, XXIV, 545-555, 5 figs.) Author holds that the chin in man is simply a result of the reduction of the teeth and of the alveolar region. Argues against Walkhoff.

Welcker (H.) *und Brandt* (A.) *Gewichtswerthe der Körperorgane bei dem Menschen und den Thieren.* (Ibid., 1-89, 42 tables.) This monograph, with bibliography of 90 titles, treats of weight

of skin, fat, brain, spinal marrow, eye, heart, arteries, lungs, thymus, thyroid, spleen, renal capsules, tongue, salivary glands, pancreas, bowels, liver, mesentery, kidneys, sexual glands, genitals, blood, etc., in normal adult man, monkeys and numerous other animals, birds, reptiles, amphibia, fish, etc. The conclusion is reached that a large animal is never the simple magnification of a small one. All vegetative organs show their maximum figure in small animals, minimum in those of average size and in the largest.

Whittaker (T. P.) *Alcoholic beverages and longevity.* (Contemp. R., Lond., 1904, 413-429.) Discusses statistics, 1840-1901. Difference in favor of total abstainers have increased during last twenty years.

EUROPE

Arnold (J. L.) *Das "Giritzenmoos" in Dagmersellen, Kt. Luzern.* (Schweiz. Arch. f. Volksk., Zürich, 1903, VII, 295-298.) Describes a carnival ceremony performed some 40 years ago at Dagmersellen in the canton of Luzerne. A sort of mock trial of "old maids," carried on by the youth of the village.

Asmus (R.) *Die Schädelform der altwendischen Bevölkerung Mecklenburgs.* (A. f. Anthrop., Brnschw., 1902, XXVII, 1-36, 2 pl., 4 tables.) Detailed study of 50 old Wend skulls from various parts of Mecklenburg (29 percent dolichocephalic, 18.7 percent brachycephalic; av. cubic cap., male 1432.5, female 1261 c.c.). Race-mixture is indicated,—original dolichocephalic Slavonic type with brachycephalic Anaryan (?) type,—removing the Mecklenburg branch from the pure type represented by the old Polish population of West Prussia.

Aus den Arbeiten der Deutschen Orientgesellschaft. (Globus, Brnschw., 1903, LXXXIV, 241-242.) Résumés accounts of excavations in Fara and Abu Hatal, southeast of Babylon; and Abusir, Egypt.

Bartels (M.) *Reicher Kindersegen.* (Z. f. Ethnol., Leipzig, 1903, XXXV, 1034.) Notes case of a woman of Leipe in the Spreewald, who between Jan. 30, 1902, and Nov. 30, 1903, gave birth to seven children (twins, twins, triplets), all boys, who died soon after being born.

- Baudoin (M.)** Le bijou en forme d'organes humains : le cœur vendéen. (Bull. Soc. d'Anthr. de Paris, 1903, v^e s., iv, 607-612.) Treats of the "Vendean heart,"—ancient and modern forms, in metal, cloth (in the wars), etc.,—which the author thinks is derived from the circular ring, and may be ultimately of Spanish origin. This note résumés Baudoin and Lacouloumère's *Le cœur vendéen* (Paris, 1903).
- Blind (E.)** Elsässische Steinzeitbevölkerung. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, xxxiv, 190-192.) Résumés data as to population of Alsace in stone age. The earliest race was dolichocephalic; no neolithic brachycephals have yet been discovered here. With metals the present dominant brachycephalic population appeared. Today more than 75 per cent. is broad-headed.
- Bloch (A.)** Origine turque des Bulgares. (Bull. Soc. d'Anthr. de Paris, 1903, v^e s., iv, 537-546.) Historical discussion (partly on basis of Arabian writers). Author thinks that the Volga Bulgarians who invaded Moesia were absorbed by the indigenous Slavs. The upper lip and nose of Bulgarian women are said to belong to the old physical type.
- Böckel (G.)** Volksrätsel aus dem Vogelsberg. (Hess. Bl. f. Volksk., Leipzig, 1903, II, 222-224.) Texts of 59 folk-riddles from Vogelsberg. An appendix (pp. 225-231) contains explanatory and comparative notes by Dr Adolf Strack.
- Bracht (E.)** Bericht über eine Reise nach den Fundstellen der "Eolithen" in West-Flandern vom 29. Mai bis 9. Juni 1903. (Z. f. Ethnol., Berlin, 1903, xxxv, 823-830.) Account of visit to the region of West Flanders where Rutot discovered his "eoliths," which the author regards as primitive implements.
- Buase (H.)** Ueber weissen Sand in vorgeschichtlichen Gräbern. (Ibid., 930.) Notes occurrence of white sand in prehistoric graves at Wilmersdorf and Rüdersdorf.
- Burmeister (Dr)** Frauenleben in Island. (Ibid., 951-957, 5 figs.) Treats of baptism, child-life, confirmation, wooing and marriage, house-life, death.
- Capitan (L.), Breuil (L'Abbé), et Peyrony.** Figures carved during the paleolithic epoch on the walls of the grotto at Bernifal, Dordogne. (Rec. of Past, Wash., 1903, II, 361-365, 5 figs.) Translated from the *Revue de l'Ecole d'Anthropologie*. See *American Anthropologist*, 1904, N. S., VI, 167.
- Capitan (L.) et Peyrony (M.)** L'abri sous-roche du moulin de Laussel, Dordogne. (Bull. Soc. d'Anthr. de Paris, 1903, v^e s., iv, 558-559.) Description of rock-shelter and remains (flints, etc.) of a pure Solutrean type. Animal bones rather few (horse, reindeer).
- Choboseau (A.)** L'émigration italienne. (Rev. Scientif. Paris, 1904, n^e s., I, 552-558.) Except Ireland, Italy loses a greater proportion of her population by emigration than any other European country. One-fourth of the permanent emigration comes from Campania and half of the temporary emigration from Venetia. The duality of Italy is well exemplified in her emigration.
- Cook (A. B.)** Les galets peints du Mas-d'Azil. (L'Anthropologie, Paris, 1903, XIV, 655-660, 4 figs.) Compares the painted pebbles of Mas-d'Azil with *churinga* ("totem") of certain Australian tribes, often indistinguishable from the "bull-roarer." The conventional red daubs are what would be expected in an age of artistic decadence, to which, according to Cook, these objects in prehistoric France belong.
- Daleau (F.)** Colliers modernes pour faciliter l'émission des dents des enfants. (Soc. Archéol. de Bordeaux, 1900-1901, XXIII, 129-131.) Describes briefly an infant's teething necklace (of pierced incisors of "a heifer that has never cropped the grass") from the Bourgeois country; another of ivy-roots; a little sack of snail-bones, to be put under the pillow; "cod bones" from Barcelona, etc.
- Une visite au Musée Pèrès à Libourne (131-134.) Brief accounts of objects of paleolithic, neolithic, bronze age, etc., chiefly from the country about Libourne. Among other specimens is a curious Eskimo harpoon and float.
- Cuillères anciennes et modernes, (Ibid., 200-201.) Briefly describes some old French brass and copper spoons, together with wooden spoons of the modern peasantry and Algerian wooden spoons. Reference is made to Piette's *Histoire de la cuiller* (1876).
- Etruscan (An)** chariot. (Rec. of Past, Wash., 1903, II, 367-372, 6 figs.) Describes the chariot, now in the Amer-

ican Museum of Natural History, found in a tomb on the Norcian road, 41 miles N. W. from Rome, and dating from ca. 600 B. C.

Favreau (*Hr.*) Eine diluviale Feuerstätte in der Einhornhöhle bei Scharzfeld. (*Z. f. Ethnol.*, Leipzig, 1903, xxxv, 957-965, 3 figs.) Describes the finds in one of the largest and most interesting caves of the Harz. Here diluvial man roasted the bones of the cave-bear, etc. The Einhornhöhle was a "station" of cave-bear hunters.

Finkenhofer (E.) Sprüche und Lieder aus dem Entlebuch. (*Schweiz. Arch. f. Volksk.*, Zürich, 1903, vii, 269-294.) Gives the dialect texts of many rimes and songs from the secluded region of the Entlebuch: nicknames, and *blason populaire*, counting-out rimes, lullabies, number-rimes, children's game-songs, songs of home and neighborhood, nature-rimes, occupation-songs, satirical rimes, dance and love songs, rimes on women, marriage, etc.

Focke (J.) Die hölzernen Milchrechnungen des Tavetschthals, Graubünden. (*Ibid.*, 36-42, 3 figs.) Describes the house and implement marks and the wooden milk-scores of the peasants of the valley of the Tavetsch. The house-marks are inherited by the youngest son. Although by 1902 the recent introduction of paper records had suppressed the old scores, the names of the owners of cows were still written by the house-mark and not with letters.

Forrer (R.) Prähistorisches auf keltischen Münzen. (*Z. f. Ethnol.*, Berlin, 1903, xxxv, 709-715, 14 figs.) Discusses the occurrence on Celtic coins of Gallic torques, prehistoric axes, the barbarization of the Dionysos head, etc.

Furrer (P.) Wie man in Ursern gegen die Kleidermode kämpfte. (*Schweiz. Arch. f. Volksk.*, Zürich, 1903, vii, 56-58.) Brief account of the dress-reform campaign of 1732 and subsequent years, instigated by the Capuchin preacher Bonaventura.

Gfeller (S.) Recepte von Dr. Jacob Jenner aus Kerns. (*Ibid.*, 46-53.) Gives numerous recipes (those out of his collection of 214 containing something superstitious) from the MS. of Dr. Jacob Jenner, 1736-1786.

Giuffrida-Ruggeri (V.) I dati dell'antropologia e il criterio cronologico a propo-

sito dei Siculi e degli Hethei-Pelasgi. (*Rev. di Stor. Ant.*, Padova, 1904, vii, repr. pp. 6.) Critique of recent literature on the Siculi and Pelasgians, particularly De Cara's *Gli Hethei-Pelasgi* (Roma, 1902). The author holds that the facts of anthropology cannot say whether the Siculi before entering Sicily were Anaryan, Aryanized, or Aryan, though it is probable that the Aryan vanguard (or better the peoples Aryanized in speech), such as the Ligurians, e. g., were somatically, and in customs very similar to the Anaryans. The Hamitic invasion of the Mediterranean admitted by De Cara must have been considerably posterior to the Eurafian invasion of Sergi, which followed the Neanderthal-Spy race very closely. The craniological affinities of the Mediterranean peoples are decidedly anterior to the "Hittite-Pelasgian" expansion.

Hahn (E.) Knochenfunde von der belgischen Küste. (*Z. f. Ethnol.*, Leipzig, 1903, xxxv, 965-966.) Brief account of the finding of a mass of bones and pottery fragments (Roman) exposed by a storm on the Belgian coast at Wenduine, probably the remains of sacrifices.

Hoffmann-Krayer (E.) Schatzgräberei in der Umgebung Basels, 1726 und 1727. (*Schweiz. Arch. f. Volksk.*, Zürich, 1903, vii, 1-22.) Gives, from contemporary documents (legal processes, etc.) data concerning "treasure-digging" in the neighborhood of Basel in 1726-1727.

— Bonaparte und der Schwyzerjoggeli. (*Ibid.*, 58.) Give dialect text of variant of No. 915 of Miss Züricher's collection of children's songs.

Huguet (J.) Bégaiement et simulation. (*Bull. Soc. d'Anthr. de Paris*, 1903, v^e s., iv, 569.) Compares the distribution of stammering in France with that of simulation and mutilation—all are more common in southern France.

Hunsinger (F.) Vor fünfzig Jahren. Erinnerungen an Hungen. (*Hess. Bl. f. Volksk.*, Leipzig, 1903, ii, 211-221.) Treats of the linden-tree by the spring easter-tide, May-time, music and song, and (pp. 215-221) the *kirmess*.

Ithen (Anna) Neujahrswünsche im Muotathala. (*Schweiz. Arch. f. Volksk.*, Zürich, 1903, vii, 59-60.) Dialect texts of seven New-Year's-wish rimes from the Muota valley.

— Einige Rätsel aus dem Kanton Zug.

- (Ibid., 60.) Dialect texts of sixteen folk-riddles from the canton of Zug.
- Bauernregeln aus dem Kanton Zug. (Ibid., 303.) Dialect texts of eight brief rimes about weather, condition of crops, fruit, etc.
- Jaekel** (O.) Feuerstein-Eolithen von Freyenstein in der Mark. (Z. f. Ethnol., Berlin, 1903, xxxv, 830-838, 6 figs.) Describes six alleged flint eoliths, or "retouched" stones of the sort discussed by Rutot, etc.
- Jentsch** (H.) Kleines Tongefäß von Starzeddel, Kr. Guben, mit Abdruck der konzentrisch geriefen Scheibe einer Metallnadel. (Ibid., 724-726, 2 figs.) Brief description of an earthen vessel whose ornamentation proves contemporaneity with metal needles. The vessel is of Billendorf-Lausitz type.
- Kahle** (B.) Der Passport bei russischen Leichenbegängnissen. (Ibid., 1006.) Historical notes on the White Russian (Smolensk) custom of putting a "passport" into the hands of the dead to ensure his entrance into Paradise.
- Klaatsch** (H.) Bericht über einen anthropologischen Streifzug nach London und auf das Plateau von Süd-England. (Ibid., 875-920, 33 figs.) Treats of Tasmanian skulls (with measurements) and scapulae in London and Paris, the remains of the "Galley Hill Man" (author considers him to be at least as old as Neanderthal) as compared with the "man of Brunn."
- Funde auf dem Terrain von Klein-Machnow bei Gelegenheit des neuen Kanalbaues. (Ibid., 732-733.) Brief account of find of a piece of staghorn, with carvings upon it.
- Koehl** (Hr.) Das römische Worms. (Corr.-Bl. d. deutschen Ges. f. Anthr. München, 1903, xxxiv, 85-90.) Brief account of Worms in Roman times,—the city was preceded by the Borbetomagus, a chief place of the Vangiones. Except Trèves, no Roman city has so many streets as had Worms.
- Kollmann** (J.) Nyare svenska antropologiska arbeten och deras betydelse för ras- och german-frågan. (Ymer, Stockholm, 1903, xxiii, 359-385.) Résumés and critiques of Retzius's *Crania suecica antiqua* (Stockholm, 1900) and *Das Menschenhirn*, and Retzius and Furst's *Anthropologica suecica* (Stockholm, 1902) by the distinguished Basel anatomist.
- Krause** (E.) Excursion der Gesellschaft nach Freisack in der Mark. (Z. f. Ethnol., Berlin, 1903, xxxv, 726-727.) Brief notes on the ring-wall, "Schwedenschanze," etc., finds of flints, etc.
- Küchler** (A.) Ein maccaronisches Senngedicht von Untervalden. (Schweiz. Arch. f. Volksk., Zürich, 1903, vii, 42-46.) Text, with explanatory notes, of a Latin-German macaronic poem (probably by J. A. Omlin, 1739-1801) describing the alp-journey and the life of the herdsman.
- Laloy** (A.) Ethnographisches aus Südwest-Frankreich. I. Die Pyrenäen. (A. f. Anthr., Brnschw., 1903, N. F., II, 43-55, 15 figs.) Treats of the peasantry of the upper valley of the Gave du Pau between Luz and Gavarnie, their agricultural and domestic implements, appliances for domestic animals, houses, wool-spinning, dress, etc.
- Landois** (H.) Baumsargmenschen von Freckenhorst. (Ibid., 1902, xxvii, 643-646.) Brief description with chief measurements of skeletons of the "tree coffin" man of Freckenhorst, in Westphalia. This "tree coffin" man shows an increase in cubic capacity of skull over the man of the preceding stone age. Remains of the "tree-coffin (hollowed out trunk) man" have now been found in at least six places in Westphalia.
- Laville** (A.) Au sujet d'un passage de la note de M. Rutot. Les cailloux de M. Thieullen. (Bull. Soc. d'Anthr. de Paris, 1903, v^e s., iv, 572.) M. Laville does not accept the sub-Chellean objects, and calls the Cergy deposit Chellean-Moustérien.
- Lissauer** (A.) Anthropologischer Reisebericht über Sizilien. (Z. f. Ethnol., Leipzig, 1903, xxxv, 1019-1034.) Résumés data concerning the archeology of Sicily, investigations of Orsi, Peterson, Virchow, *et al.* Influence of Mohammedan rule is noted, also the large number of fair-complexioned native Sicilians.
- Lüdemann** (K.) Das Gräberfeld von Kricheldorf, Kr. Salzwedel, Prov. Sachsen. (A. f. Anthr., Brnschw., 1904, N. F., I, 236-253, 3 figs.) Gives results of examination by author of 150 graves out of a total of 750 in two "cemeteries," belonging probably to two different villages existing contemporaneously about

400 B. C.—100 A. D., during the La Tène period. The iron and in part the bronze implements are of native workmanship. The absence of weapons indicates a sedentary population. Five types of pottery are distinguished, and the ornamentation is rather crude. The glass-beads are possibly exotic.

Macdonald (Sheila) Old-world survivals in Ross-Shire. (Folk-Lore, Lond., 1903, XIV, 368–384.) Cites beliefs and practices concerning fairies, suicide, epilepsy, seventh son of seventh son, *corp creagh* (witch doll), funerals, omens, evil eye, Michaelmas cakes, dress, etc. The author notes “how very similar are the Afghans in many of their characteristics to the Celtic race.”

Manning (P.) Stray notes on Oxfordshire folk-lore. (Ibid., 410–414.) Brief folk-tales relating to Lorenzo Dow, wagers, etc.

Manouvrier (L.) Deuxième examen, à 15 ans, d'un microcephale observé à 7 ans. (Bull. Soc. d'Anthr. de Paris, 1903, V^e s., IV, 593.) Brief description, with cephalic measurements of a microcephalous boy, observed when 7 years old and again (1903) when 15. No sensible diminution of the microcephaly has occurred, but the nervous centers have undergone some “physiological education.” His idiocy is less complete, but still characteristic.

Mehlis (C.) Ueber Ausgrabungen von Grabhügelgruppen der Vorderpfalz. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 188–189.) Résumés data concerning excavations of groups of tumuli in the Rhine valley and on the edge of the Harz and the remains therein discovered. Some of the tumuli (with inhumation) belong to the bronze period; others (burial and cremation; monoliths) to the Hallstatt period; others (cremation, urns) to the La Tène epoch; and one to the Roman period.

— Exotische Steinbeile der neolithischen Zeit im Mittelrheinland. (A. f. Anthropol., Brnschw., 1902, XXVII, 599–611, 8 figs.) Treats of the stone idol of Drusenheim in Lower Alsace, two jadeite axes from the Rhenish Palatine and another from Hohkönigsburg. Egyptian origin is suggested for the Drusenheim idol and Asiatic provenance for the axes.

— Das Grabhügelfeld an der Heidenmauer bei Dürkheim an der Hardt.

(Ibid., 1903, N. F., I, 51–55, 4 figs.) Gives results of investigation of five tumuli and the objects therein found,—iron, bronze, pottery, funeral urns, stone for crushing cereals, etc. No trace of Roman influence and little of direct Italian. These graves belong to the La Tène period and the culture represented has an aspect of poverty and retrogression.

— Die Grabhügel im Ordenswalde und Hasslocher Walde bei Neustadt a. d. H. (Ibid., 56–59, 6 figs.) Brief account of examination of three mounds and contents, pottery, objects of iron, etc. The last fix the graves as of the late La Tène period. The pottery shows decadent Hallstatt type. A number of small arrow-heads and flint knives were found.

Pellandini (V.) Spigolature di folklore ticinese. (Schweiz. Arch. f. Volksk., Zürich, 1903, VII, 23–28.) Gives dialect text and literary Italian rendering of two lullabies, 13 cantilene and filastrocche, three children's singing games; also a large number of nick-names of places in the Ticino, and twelve proverbs.

— Storielli ticinesi. (Ibid., 300–302.) Italian texts of two folk-tales from Ticino.

Penck (A.) Die alpinen Eiszeitbildungen und der prähistorische Mensch. (A. f. Anthr., Brnschw., 1903, N. F., I, 78–90.) Discusses the various alpine formations in their relation to the chronology of prehistoric human remains (a table of parallel geologic and culture data is given). Views of Brückner, Richter, G. de Mortillet, Much, Nüesch, Rutot, etc., are considered.

Piètrement (M.) Chars de guerre gaulois. (Bull. Soc. d'Anthr. de Paris, 1903, V^e s., IV, 570–571.) Argues against Nicaise that the use of war-chariots by the Gauls continued after the time of Caesar.

Piette (E.) Notions complémentaires sur l'Asylien. (L'Anthropologie, Paris, 1903, XIV, 641–653, 3 tab., 13 figs.) Treats of the “numbers” and “alphabetic characters” of grotto of Mas-d'Azil, painted on pebbles, etc. The Azil epoch was a period of transition, coming after Pleistocene times. The Azil numerals, Piette thinks, are the source of the Egyptian numbers, while the Azil symbols were adopted in the Phoenician and ancient Greek alphabets, etc. The remains of Mas-d'Azil indicate mixed culture, or “foreign invasion.”

- Recently discovered** inscribed caves at Teyrat and Altamira. (Rec. of Past, Wash., 1903, II, 365-367.) Based on the accounts of Capitan, Breuil, Peyrony, Cartailhac, Reinach. See *American Anthropologist*, 1904, N. S., VI, 167.
- Reuter (F.)** Beiträge zur Anthropologie Hinterpommerns. Eine Schuluntersuchung in Rollnow. (A. f. Anthr., Brnschw., 1903, XXVII, 289-337, curves, tables.) Results of investigation (19 measurements, 14 other data) of 373 school-children (boys 189) between 6 and 14 years of age. Comparison with other results in Europe and America. Boys are somewhat more dolichocephalic; extreme forms of face more common in girls, transitional less. Girls slightly lighter in eyes and hair, more blonde and brunette, and less mixed types. Girls inherit fewer qualities of fathers' head.
- Rossat (A.)** Chants patois jurassiens. (Schweiz. Arch. f. Volksk., Zürich, 1903, VII, 241-269.) Concluding section. Gives dialect text, with literary French versions, of Nos. 172-206 of satirical folk-songs from the Jura.
- Schær (A.)** Balthasar Han's und Hans Heinrich Grob's "Schützenausreden." (Ibid., 26-36.) Discusses the relation of Grob's *Schützenausreden* (Zürich, 1603) to the earlier work of Hans, *Ausreden Aller Schützen*, published about 1560.
- Schmidt (II.)** Bemerkungen zu der Abhandlung von Köhl über die Bandkeramik der Steinzeitlichen Gräberfelder und Wohnplätze in der Umgebung von Worms. (Z. f. Ethnol., Berlin, 1903, XXXV, 747-752.) Critique of article of Köhl. Author thinks Köhl's three groups will stand, but their chronological relations are not yet made out.
- Schnippel (Hr.)** Ringhalskragen aus Bronze. (Ibid., 746.) Notes a find of beautiful bronze collars of the best Hallstatt period at Dittersdorf.
- Schoetensack (O.)** Ueber die Gleichzeitigkeit der menschlichen Niederlassung aus der Renntierzeit im Löss bei Munzingen unweit Freiburg i. B. und der paläolithischen Schicht von Thaingen und Schweizersbild bei Schaffhausen. (A. f. Anthr., Brnschw., 1903, N. F., I, 69-77, 9 figs.) From consideration of the geological conditions, the stone implements, artificially worked bones, *fibula paleolithica*, etc., the author seeks to show that the Munzinger paleolithic "station" is contemporaneous with those of Thaingen and Schweizersbild.
- Shahan (T. J.)** Social history of Ireland. (Cath. Univ. Bull., Wash., 1904, X, 69-80.) Critical review of P. W. Joyce's *A Social History of Ancient Ireland* (London, 1903), a very valuable book.
- v. Ujfalvy (C.)** Anthropologische Betrachtungen über die Porträtmünzen der Diadochen und Epigonen. (Ibid., 1902, XXVII, 613-622, 16 figs.) Treats of the features, as portrayed on coins of the Macedonian kings of the family of Antigonos Monophthalmos, the Syrian Seleucidæ, the Egyptian Lagidæ. Characteristic through generations are the forehead of the Antigonidæ, the nose of the Seleucidæ, the chin of the Lagidæ,—with the toning down of the other Macedonian characteristics, these appear even more marked.
- Vassits (M. M.)** Die neolithische Station Jablanica bei Medjulužje in Serbien. (A. f. Anthropol., Brnschw., 1902, XXVII, 517-582, 133 figs.) Treats in detail of sculpture, ceramics, etc. The most interesting and important objects found are the clay idols (female). The relations of Jablanica to Butmir are closer than to Mycenæ. The author connects the culture of Jablanica with the Phrygians, a Thracian stock. See *American Anthropologist*, 1902, N. S. IV, 330.
- Werner (J.)** Die Zoche, eine primitive Pflugform. (Z. f. Ethnol., Berlin, 1903, XXXV, 716-720, 8 figs.) Describes the "zoche," a plow of a primitive type formerly in general use in East Prussia. With the oxen a whip, but no lines, is used. The plow of the Triaman of Bencoolen, Sumatra, closely resembles the "zoche."
- Wünsch (R.)** Griechischer und germanischer Geisterglaube. (Hess. Bl. f. Volksk., Leipzig, 1903, II, 177-192.) Comparative study of Greek and Teutonic spirit-lore,—animism, soul-cult, realm of the dead, return of ghosts and manes, restless spirits, conjuration of the dead, etc. Dr Wünsch explains resemblances noted, not by borrowing, but by independent evolution.
- Zaborowski (M.)** Présence d'un chameau dans une grotte néolithique des environs de Salerne, sud d'Italie. (Bull. Soc. d'Anthr. de Paris, 1903, V^e s., IV, 557-558.) Author agrees with Regalia tha

the camel of the Zachito cave, near Salerno, came over-sea from Asia, — its introduction was accidental. This cavern is very rich in animal remains.

— Crâne néanderthaloïde d'une caverne néolithique des environs d'Ojcow. (Ibid., 564.) Description, with measurements, of the skull of Ojcow, a sporadic specimen of the Neanderthal type.

Züricher (G.) Hausinschriften aus dem Berner Oberland. (Schweiz. Arch. f. Volksk., Zürich, 1903, VII, 53-58.) Texts of twenty house-inscriptions from various parts of the Bernese Oberland.

AFRICA

Bertrand (G.) The chariot of Thotmes IV. (Rec. of Past, Wash., 1903, 11, 344-346.) Translated from the Paris *Science Illustrée*. Describes the chariot found in the tomb of an Egyptian king of the eighteenth dynasty.

Bloch (A.) Une excursion à Tanger. Ce que nous croyons de l'origine des Maures. (Bull. Soc. d' Anthr. de Paris, 1903, 1^{re} s., IV, 573-579.) Account of visit to Tangier in 1903. M. Bloch thinks the Moors of Morocco are "Berbers of a special race, produced naturally by the transformation of the negro type." The Moors of Spain were Arabs who brought with them Berbers and other North Africans.

Cartwright (Mrs M.) Basutoland. Its legends and customs. (Folk-Lore, Lond., 1903, XIV, 415-418.) Treats of the author's Basuto names, "schools," *molimo*, child's name, proverbs.

Cleve (G. L.) Die Lippenlaute der Bantu und die Negerlippen, mit besonderer Berücksichtigung der Lippenverstümmelungen. (Z. f. Ethnol., Berlin, 1903, XXXV, 681-702, map.) Interesting study of lip-mutilation in connection with sound-production among the negroes of Africa in particular, with some notice of American Indian tribes. The author believes that the form of the negro lip makes necessary a *v* instead of a *b*. Disappearance of labial sounds are due to lip-mutilation. At pages 698-700 is a Mavia-Konde vocabulary.

Déchelette (J.) L'archéologie préhistorique et les fouilles de Carthage. (L'Anthropologie, Paris, 1903, XIV, 661-675, 17 figs.) Treats of terra-cotta bas-reliefs, semicircular bronze (ritual?) axe, swan-headed decorated bronze "hatch-

ets" (thought by some to be "razors"), etc. According to M. Déchelette the oldest Carthaginian tombs are not anterior to the eighth century B. C. Greek and Egyptian influences are noted.

Drysdale (A. T.) Notes on Basutoland. (J. Afric. Soc., Lond., 1903, 208-212.) Treats of country, condition of natives, climate, etc. The Basutos are very intelligent and "capable of hard work." They practise agriculture more than other Kaffir tribes. The worst natives are the converted ones, who are both dishonest and dirty.

Fridolin (J.) Afrikanische Schädel. (A. f. Anthr., Brnschw., 1902-1903, XXVII, 339-347.) Results of measurements of 29 skulls from various parts of Africa, including two Bongos. The range of cephalic index is 67.0-75.4, average 71.6.

Hippolyte-Boussac (P.) L'hippopotame dans l'Egypte ancienne. (Rev. Scientif., Paris, 1904, 1^{re} s., I, 425-427.) Brief account, based on Herodotus, the Egyptian monuments, etc., of the hippopotamus among the people of the Nile. It was personified in Apet, the queen of heaven, and also as Set-Typhon. In monumental art the hippopotamus had no great rôle.

Huguet (J.) Les villes mortes du Mzab. (Bull. Soc. d' Anthr. de Paris, 1903, 1^{re} s., IV, 583-590.) Brief notes on the dead towns and fortified enclosures of Ksar-el-Amhar, Mbertackh, Thilez d' Ith, Bordj Lalla-Rhira, Krime Châr, Ksar Hannoucha, Ksar Oulad Nçer, Tmizert, Ksar Lououal, Ksar Sidi Saâd, their history, etc. The pre-Abadite history of the Mzab is still little known.

Lehmann-Nitsche (R.) Erklärung der Bregmanarben an alten Schädeln von Tenerife. (Z. f. Ethnol., Berlin, 1903, XXXV, 722-724.) Attributes the bregma-scars on old Canary islands skulls to surgical operations as described by old chroniclers.

Mélila (J.) Le bœuf dans la vie Malgache. (Rev. Scientif., Paris, 1904, 1^{re} s., I, 111-116.) Treats of cattle-lore among the Malagasy, — food, immolation at puberty-ceremonies, sickness-sacrifices, religion, mythology, proverbs. As early as the seventeenth century Madagascar was the El Dorado of cattle and even now represents the age and culture of the cow, or rather zebu.

- Merker (Hr.)** Religion und Tradition der Masai. (Z. f. Ethnol., Berlin, 1903, xxxv, 733-744.) Treats of "the chosen people," spirit-lore, creation and deluge legends, the last in detail. Correspondence with biblical traditions is noted and a community of race, culture and religion with the primitive Israelites assumed. Author looks on Masai as ancestors of Israelites who did not borrow biblical myths from Babel but had them as their primitive heritage.
- Michel (G. B.)** The Berbers. (J. Afric. Soc. Lond., 1903, 161-194, 2 pl., map.) Treats of names,—author derives *Afer* from Berber *ifri* "a cave," holding that the earliest inhabitants were troglodytes,—commercial aptitudes, geographical distribution, physical types (Gætulian, Iberian, fair Libyan, Celto-Ligurian), language (Berber is "an inflexional language of the Caucasian type"), megalithic monuments (due to Celtic race), ancient modes of sepulture, "Punic" tombs, cave-dwellings, use of veils by Twarik men, unchastity of Twarik women, organized aristocracy of the Twarik, village republics, dwellings, commercial instincts (strong in all Berbers), industries (pastoral, few crafts), history and relations with other peoples. Author seeks to make out an ethnological connection between *Berber* and *Bornu* and rejects the theory of an entirely Hamite origin of the Berbers.
- Mockler-Ferryman (A. F.)** Christianity in Uganda. (Ibid., 276-291.) Résumés history of missionary efforts (Christian and Mohammedan), native wars and disputes, Protestant-Catholic complications, etc. Lately both the latter religions have prospered, and "Uganda is to all intents and purposes at the present time a Christian kingdom."
- Native crowns.** (Ibid., 312-315.) Gives items concerning the crowns of West African chiefs from the statements made by the Oni of Ife during his visit to the Governor of Lagos. The Oni's crown was 200 years old.
- Nüesch (A.)** Antrag betr. Untersuchung der Zwerge in den deutschen Colonial gebieten Afrikas. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, xxxiv, 189-190.) Argues for governmental support of the investigation of dwarf-races in the German African colonies: Bushmen, Bojaeli, Watindiga, Wanoge, Akkas, Batua, Virunga, Kiwu, Watwa.
- Schweinfurth (G.)** Steinzeitliche Forschungen in Oberägypten. (Z. f. Ethnol., Berlin, 1903, xxxv, 798-822, 2 pl.) Treats of the eolithic and paleolithic (the later epoch of this age is 25,000 B. C.) periods in Upper Egypt and the remains characterizing them, with comparisons with corresponding European chronologic stages and references to the labors of other investigators. Brief list of technical terms in German and French.
- Stanton (E. A. E.)** The peoples of the Anglo-Egyptian Soudan. (J. Afric. Soc., Lond., 1903, 121-131, 5 pl., map.) Treats of negro tribes (Shilluk, Dinka, Nuer, Nuba, Niam Niam, Nuak, Bongo; the Shilluk and Nuba are praised for honesty and morality), Arab tribes nomadic and sedentary (Baggara, Kenana, Lahawin, Hassanieh, Kababish, Shukerieh, Battalim, Jaalian, Resheida, Hadendowa, etc.). Author thinks negro formerly extended to Wady Halfa. There are now two zones, Negro and Arab.
- Staudinger (P.)** Vier Mühlsteine, ein Topf und zwei Perlenketten von den Guanchen stammend. (Z. f. Ethnol., Berlin, 1903, xxxv, 728-729.) Brief description of four mill-stones (of hand-mills), a "ganigo" pot, and two strings of burnt clay beads from the caves of Barranco, Martianez, and Puerto de la Cruz; the rock-inscriptions are also referred to.
- Abbildungen aus den Annalen des Kongo-Museums. (Ibid., 730-731.) Calls attention to the articles by Lieut. Massui on music, dance, song, and musical instruments, and by X. Stainier on "the Congo stone age" in the *Annales Musée du Congo*.
- Einige ethnologische Vorlagen. (Ibid., 796-798.) Brief notes on beads from the Congo region, possibly of old Egyptian or early European origin.
- Stoppord (J. G. B.)** English governor and African chiefs. (J. Afric. Soc., Lond., 1903, 308-311.) Notes on the procedure of the native council of 26 chiefs, during the meeting with the Governor of Lagos.
- Upward (A.)** The province of Kabba, Northern Nigeria. (Ibid., 235-260.) Treats of country and climate, population, industries, trade, native governments, law, religion, the white man. The population consists of Bunnus (with

few Haussa and Yorubas), Kukurukus, Egbiras, etc. The town of Lokoja is "the meeting-place between the Sudan and the coast, the semi-civilized Mohammedan and the savage pagan, the Nile valley being the natural boundary between Islam and cannibalism." The typical government has a head king and a deputy. Upon the natives all forms of religion "sit lightly." The white man is not really popular in Kabba. Not systems but administrators are needed.

Welsh (I.) Contrasts in African legislation. (Ibid., 195-207.) Discusses the Transvaal liquor law of 1901, which prohibits intoxicating "brews or mixtures" of all sorts to "any colored person," in comparison with the unrestricted trade on the West Coast. In Africa there is no moral force existing as a counterpoise to liquor.

Wright (E. B.) Native races in South Africa. (Ibid., 261-275.) Résumés data concerning Zulus, Bantu, etc., in the *Blue Book*, published by the Cape Government in 1883. South African natives are "neither vicious, nor debased, nor hopelessly lazy," and, treated intelligently, "will undoubtedly prove a valuable asset in the labor-market." Witchcraft is the most serious handicap.

ASIA

Birkner (F.) Beiträge zur Rassenanatomie der Gesichtsweichtheile. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 163-165.) Gives results of facial measurements of 6 Chinese bodies in comparison with those of 24 suicides, 9 criminals, and 21 normals. In the Chinese the soft parts of the face "are at the points more important for the racial figure thicker than those of Europeans."

Cumming (A. S.) The story of Indra Bangsawan. (Folk-Lore, Lond., 1903, XIV, 385-407.) Gives literal translation of first few paragraphs, abstract of remainder and translation of rough poetic repetition at close of the tale of *Indra Bangsawan*, a Malay story, acted to day in the native theater at Singapore. Indra Bangsawan is the youngest of twin sons of a wise monarch.

Delitzsch (F.) Esagila, the Babylonian Pantheon. (Rec. of Past, Wash., 1903, II, 323-331, 11 figs.) Historical account, from the earliest period down to

the Christian era, of the chief temple of Babylon and its ruins, recently excavated.

Dussaud (R.) Les régions désertiques de la Syrie moyenne et le cheval arabe. (Bull. Soc. d'Anthr. de Paris, 1903, v^e s., IV, 560-563.) Author calls attention to the ancient *graffiti* on the basaltic rocks of Safâ in the El Harra desert, s. s. e. of Damascus, as showing the antiquity of the Arab breed of horse and the possession of such animals by the Arabs before their incursion into Africa.

d'Enjoy (P.) Du droit successoral en An-Nam. Institution d'hérédité.-Biens du culte familial. Fêtes rituelles. (Rev. Scientif., Paris, 1904, v^e s., I, 493-496.) Treats of Annamese property laws and rights of succession, the ritual family festivals, burial rites, etc. Equality of partition yields temporarily to religion only and the unity of the family is perpetuated.

Fischer (A.) Ueber die Selungs im Mergui-Archipel, sowie über die südlichen Shanstaaten. (Z. f. Ethnol., Berlin, 1903, XXXV, 966-992, 16 figs.) Based on recent visit. Treats of physical character (Malayoid), houses, boats (a fireplace in each, as they are really the dwellings), diving, family-life, marriage, etc., of the Selungs. Meaning of Shan, ethnographic notes on the Taungthu, Taungyo, Intha of Lake Inle, Padaungs, red Karens of Loikaw, etc. The rowing of the Intha is rather acrobatic. The Shans have a higher esthetic sense than the Burmese. The Karen house is on piles. The Selungs, Dr Fischer thinks, are not *civilisationsfähig*.

Foy (W.) Beitrag zur Kenntnis der Chaldäer. (Ibid., 752-755.) Criticises adversely Oppert's rapprochement of Chalkis, Chalkide and Greek 'χαλ'χέις ("blacksmith"), and the ideas of Goldstein on the same topic.

Ghosn el Howie (Mrs) Antiquities in Mt. Lebanon, Syria. (Rec. of Past, Wash., 1903, II, 337-340, 2 figs.) Treats of rock-hewn tombs and other remains, including Roman pottery, coins, etc., at M'Ruj, Merjaba, Sumborta, and other places.

Goldstein (F.) Berichtigung. (Z. f. Ethn., Berlin, 1903, XXXV, 921.) Author seeks to correct the citation of his views on the word *Chaldi* and its derivatives by Dr Foy. See *American Anthropologist*, 1903, N. S., V, 716.

Krause (E.) Die Verbrennung einer japanischen Leiche in China. (Ibid., 926-928.) Reproduces from a newspaper the account of the cremation near Tsingtau of the body of a Japanese. The charred bones are said to be sent to Japan.

Toldt (C.) Die Japanerschädel des Münchener Instituts. (A. f. Anthr., Brnschw., 1902-1903, XXVII, 143-183, 2 figs., tables.) Descriptions and measurements of 10 Japanese skulls (8 male) and a skeleton, with references to data of Bälz and Koganei. Author doubts whether, as some hold, the Ainu skull is greater than the Japanese.

Zaborowski (M.) Les congrégations en Chine. (Bull. Soc. d'Anthr. de Paris, 1903, v^e s., IV, 548-550.) Résumés a recent article in the *Mercur de France* with this title by Alexandra Myrial. The monk and nun idea is really exotic in China, where the family is the basis of social life and activities, and is of Buddhist provenance.

INDONESIA, AUSTRALASIA, POLYNESIA

Bauer (F.) Ueber Schädel von den Philippinen. (A. f. Anthropol., Brnschw., 1902-1903, XXVII, 107-116, 9 figs.) Discusses form, measurements of four skulls, three from Luzón and one from Mindanao (Cagayan, near Misamis.) The first Luzón skull came from a cave in Albay, and is deformed. Dr Bauer calls attention (as did Virchow) to the resemblance of the type (as shown by indices) of Philippine skulls with those of Peruvians. It is possible that some of the skulls called Philippine originally belonged to Peruvian slaves introduced by the Spaniards.

Born (Dr) Einige ethnologische Notizen aus Jap. (Z. f. Ethnol., Leipzig, 1903, XXXV, 929-930.) Brief notes on the lowering of canoe-masts with shamanistic ceremonies, the natives of Feys island, relations between Mapia and Jap. Dr Born says of a young Feys islander, "the first impression made upon me was almost that of a young Teuton of primitive times."

— Ueber Eingeborenen-Medizin und Verwandtes. (Ibid., 790-791, 1 fig.) Brief notes on killing by poison (*jap*) and a corpse exhumed by the author.

Collingridge (G.) Exploration française à l'île de Santo. (Bol. S. da Geogr. de Lisboa, 1903, 389-392, map.) Notes on the French expedition of 1901 and the natives met. The conduct of the latter was "almost the same" as when encountered by the Portuguese Queiroz three centuries ago, when he visited and founded the "New Jerusalem," in the New Hebrides.

Dodge (E. A.) Our Mohammedan subjects. (Pol. Sci. Q., Boston, 1904, 20-31.) Treats chiefly of recent events among the Moros of the southern Philippines.

Peggs (Ada J.) Notes on the aborigines of Roebuck bay, Western Australia. (Folk-lore, Lond., 1903, XIV, 324-367, 6 pl.) Extracts from letters, 1898-1901, descriptive of native Australian life, customs, institutions, implements, art, etc. Appended are the English versions of 5 brief animal tales. Boomerang-making, body painting and marking, marriage, message-sticks, tribal marks, funeral ceremonies, fire-sticks, food (aversion to pork), bull-roarers, cannibalism (extinct?), fights for women, masks, sick-healing, infanticide, songs, "magic," dances, etc.

Rascher (P.) Die Sulka. Ein Beitrag zur Ethnographie von Neu-Pommern. (A. f. Anthr., Brnschw., 1904, N. F., I, 209-235.) Treats of habitat and tribal divisions, marriage (women choose husbands), birth and childhood, puberty and attainment of manhood (circumcision, blackening of teeth, etc.), death and burial, beliefs about souls and spirits (fear of evil-minded spirits), magic and charming (love-charms, vengeance-ceremonies, protective rites for persons, rites with animals, plants and inanimate objects, weather-making), superstitious ideas, masks, tales and legends (abstracts of 6 original and cosmogonic tales), etc. The existence of subterranean dwarfs is believed in. Tale-telling is tabooed in day-time.

Waldeyer (A.) Ueber Schädel-Variation. (Corr.-Bl. d. deutschen Ges. f. Anthr., München, 1903, XXXIV, 192-193.) Brief note on the *processus retromastoideus* in Papuan skulls from the island of Tamara (Berlinhafen), which may be due to the use of modern pillows.

Westwood (Hr.) Ueber zwei auffallend grosse und starke Kinder. (Z. f.

Ethnol., Berlin, 1903, xxxv, 925-926, 1 fig.) Brief note by father on a New Zealand boy of 6 years and girl of 10, who weigh respectively 78.2 and 104.88 km., and are 134.6 and 149.8 cm. tall. The other five children are of normal size, the parents rather weakly.

AMERICA

Barry (P.) The ballad of "Lord Randal" in New England. (J. Amer. Folk-Lore, Boston, 1903, xv, 258-264.) Records, with music in most cases, six New England versions of this famous ballad.

Bartels (M.) Die sogenannten Mongolen-Fleck der Eskimo-Kinder. (Z. f. Ethnol., Berlin, 1903, xxxv, 931-935.) Calls attention to Saabye's account (1770-1778 A. D.) of "blue spots" on Eskimo children from western Greenland and Eschricht's citation of it in 1849. Dr Bartels, on the authority of missionary Stecker, adds the Eskimo of the Kuskokwim region in Alaska to the people among whom "Mongol spots" occur.

Beauchamp (W. M.) Reply to "Who made the Bone Combs?" (Ann. Arch. Rep., 1903, Toronto, 1904, 85-86.) Argues that bone combs, except in Jefferson co., N. Y., are not earlier than the year 1600, and that the Indian had his idea of making the comb from European examples.

Birch (F.) The "Standing Rock." (Ibid., 98-101.) Disagrees with Father Jones' location of the "Standing Rock" of the *Jesuit Relations*, and claims to have discovered it at the place known as "Indian Caves," some $5\frac{1}{4}$ miles north.

Borba (T. M.) Observações sobre os indígenas do Estado do Paraná. (Rev. do Museu Panl., S. Paulo, 1903, vi, 53-62, 1 fig.) Ethnographic notes on the Caingang and Arés (Botocudos), with a brief vocabulary of the latter. The deluge-myths of these Indians are given on pp. 51-62, that of the Botocudos invites Algonquian *rapprochement*.

Boyle (D.) Who made the effigy stone pipes? (Ann. Arch. Rep., 1903, Toronto, 1904, 27-35.) Critique of Mr Joseph D. McGuire's views on the European origin of "Indian" effigy pipes, as expressed in his *Pipes and Smoking Customs of the American Aborigines*. See MCGUIRE. Mr Boyle thinks the inventive capacity of the Indian sufficient

to account for many pipes thought to be European.

— The working of native copper. (Ibid., 36-43.) Discusses views of Moore and McGuire and concludes that "there would seem to be no doubt that copper manipulation was practised by the Indians long before the discovery, and that the invention, or application of the socket, as well as the use of a tying-hole, in connection with arrow and spear-heads, is wholly due to aboriginal ingenuity or adaptiveness."

— Working methods. (Ibid., 48-85, 51 figs.) Treats of unfinished and finished stone pipes, clay pipes, stone axes, slate knives, slate pendant, stone gouges, pebble gorget, how the Indian mended stone, stone files or steel files, some mechanical methods, bone and horn, who made the bone combs? Argues that the Indian method of work exhibited in many of these implements and instruments of itself precludes imitation of European models with European tools. Evidence as to the use of a steel file is deceptive. Against Beauchamp, Boyle credits the Indians with making bone combs. European contact and metallic tools were not necessary to produce them.

— A shell neck-lace. A few copper tools. A brass smoking pipe. Bored skulls. A burial place in Onondaga township. A good piece of work in stone. (Ibid., 87-95, 11 figs.) Describes a necklace from York county, representing three periods of time and workmanship (probably in part evidencing European influence); a copper fish-hook from Isle Royale (the only one in the museum); a brass pipe from Onondaga probably made by a white man; two Indian skulls from Lambton county, one with six, the other with three post-mortem perforations. The burial place contained 16 graves, the remains found in which indicate a period about 1700-1750. The stone object cited is a finely made pestle from Comox, B. C.

— British Columbia mummies. (Ibid., 96-97, 2 figs.) Brief account of two Clayoquot mummies recently acquired by the Museum.

— Village sites in North Orillia. (Ibid., 103-104.) Brief notes on the sites on Roger's farm and on the Hall lot near Orillia, — perhaps one of the original Cahiaqués.

—The killing of Moostoos, the Wehtigoo. (Ibid., 126-138.) Gives extracts from the court copy of the evidence in the trial of Payoo and Napayoosee, Cree Indians of Smoky river, 75 miles from Little Slave lake, for having in 1899 killed Moostoos, a member of their tribe, who declared himself a *wehtigoo* (*wendigo*) or "one possessed."

Brown (C. E.) The native copper implements of Wisconsin. (Wisc. Archeol., Milwaukee, 1904, III, 49-86, 12 pl.) Treats of source, mining, fabrication, distribution, classes and function. Axes, hatchets, chisels, spuds, gouges, adzes, spiles, spatulas, knives, spear and arrow points, harpoon points, pikes and punches, awls and drills, spikes, needles, fish-hooks, peculiar implements are described. The number of Wisconsin copper implements is very large; the Lawson catalogue lists 13,000 and the collecting of 30 years has not exhausted the supply. Glacial or "float" copper was used as well as the Lake Superior metal. No evidence of a "lost art" is present. As compared with village sites and fields, Wisconsin mounds and graves furnish few specimens. A good paper.

Casanowicz (I. M.) Oriental and classical archeology in the United States National Museum. (Rec. of Past, Wash., 1903, II., 355-361, 7 figs.) Brief account of the collection, their arrangement, value, etc.

Chamberlain (A. F.) The contributions of the American Indian to civilization. (Proc. Amer. Antiq. Soc., Worcester, 1903, N. S., XVI, 91-126.) Treats of geographical names, words and phrases furnished to English, influence on literature, trails, frontier, fur trade, devices in hunting, fishing, etc., agricultural processes (guano, fish manure), ornament and esthetics, influence on art, fibers, textiles, clothing, recreations (lacrosse), tobacco, potato, manioc, tomato, pumpkin, beans, fruits, folk-foods, maple-sugar, gum, wild-rice, maize and its derivatives, maté, cocoa and chocolate, pulque and other liquors, medicines (herbs, quinine, coca, curari), "mescal button," intermingling of whites and Indians, ideal of Hiawatha.

Förstemann (E.) Zur Madrider Maya-handschrift. (Z. f. Ethnol., Berlin, 1903, XXXV, 771-790, 7 figs.) Discusses in detail certain figures of days in

Tro-Cortesianus 65-72. Author argues that the 32 day-groups of 6 hieroglyphs each, which occur in addition to the 8 columns of 32 hieroglyphs, belong to the eighth and last column of these.

Gibbons (J.) Iroquois in the Northwest Territories. (Ann. Arch. Rep., 1903, Toronto, 1904, 125-126.) Brief note on "Michel's Band," near Edmonton Alberta, now "Indians" only in name.

Hamilton (J. C.) The Algonquin Manabozho and Hiawatha. (J. Amer. Folk-Lore, Boston, 1903, xv, 229-233.) Treats of the idea of Manabozho as found in the early writers and among the Algonkian Indians of the north shore of Lake Superior where his feats are commemorated in geographical names, etc. Longfellow's misnomer of Hiawatha is pointed out.

Harris (W. R.) The Caribs of Guiana and the West Indies. (Ann. Arch. Rep., 1903, Toronto, 1904, 139-145.) Brief historical account with ethnographic notes, etc., habits, customs, chiefly from old authorities. Their councils of war are said to have been "held in a secret dialect or jargon, in which the women were never initiated" — besides there were different dialects for men and women, so an "educated" Carib needed really to speak three languages.

Hunter (A. F.) Indian village sites in North and South Orillia townships. (Ibid., 105-125, map.) After general account of sites, burials, trails (Muskoka, Coldwater, Huron, Atherley), the author catalogues, with brief statements of situation, contents, etc., twelve sites in North and twenty-one in South Orillia, besides the fishing-station at the Narrows (belonging to the Hurons). The Orillias contain the line of contact between the Hurons and the Algonkins of the *Jesuit Relations*, and the author says, "what I am inclined to call the Algonkin sites have distinct characters, and might almost be said to preponderate over the Huron sites in the Orillia townships." The Algonkian sites show abundance of stone and pottery disks, individual burials, highly decorated pipes and pottery, greater abundance of bone needles, awls, etc., of flints, etc., also brass arrow-heads made from fragments of old kettles. The Mount Slaven site close to Orillia is described in considerable detail, — it is not Cahiagué, as some have thought.

- von Ihering** (H.) Os Guayanãs e Caingangs de S. Paulo. (Rev. do Museu Paul., S. Paulo, 1902-1903, VI, 23-44.) Historical-ethnographic account with résumé of literature. Author affiliates these Indians with the Gês. The S. Paulo Guayanãs are probably identical with the Caingangs. The Guayanãs of the Upper Paraná differ in language and other respects from those of S. Paulo.
- Keane** (A. H.) Cultura de los nativos Americanos. Su evolución independiente. (An. d. Mus. Nac. d. Méx., 1903-1904, 2^a ep., I, 35-40, 41-44.) Translated from the *International Quarterly*, 1902, V, 338-357. See *American Anthropologist*, 1902, N. S., IV, 561.
- Laidlaw** (G. E.) Indian village sites in North Victoria. (Ann. Arch. Rep., 1903, Toronto, 1904, 101-102.) Brief notes on new sites Nos. 36-39 and the relics found, particularly a very large stone bear pipe from Tiny township, Simcoe co., obtained from a man in Fenelon, Victoria.
- Lehmann-Nitsche** (R.) Gleichzeitigkeit der südpatagonischen Höhlenbewohner mit dem Grypotherium und andern ausgestorbenen Thieren der argentinischen Höhlenfaunas. (A. f. Anthropol., Brnschw., 1902, XXVII, 582-597, 4 figs.) Concludes that the evidence shows that the man of the southern Patagonian caves, slew, skinned, cut up and ate raw the great edentate (*Grypotherium*), which may have been a kind of domestic animal. The remains of an extinct species (*Onohippidium*) of horse are such as to indicate its use as food by cave-man. The *Grypotherium* was probably exterminated by man in historical times. See *Amer. Anthropologist*, N. S., vol. VI, pp. 185-188.
- McGuire** (J. D.) Reply to "Who made the Effigy Pipes?" (Ann. Arch. Rep., 1903, Toronto, 1904, 43-46.) Reply to critique of Mr Boyle and reassertion of opinion as to European influence in the matter of tobacco-pipes.
- Notes on copper workers. (Ibid., 46-47.) Defends against Mr Boyle his opinion concerning white influence in the production of thin embossed sheets of copper.
- Martin** (W. B.) Religious ideas of American Indians. (Cath. Univ. Bull., Wash., 1904, X, 35-68, 225-243.) Based chiefly on Jesuit records, with references to some of the chief recent literature (bibliography). After historical and general introduction, author treats of conceptions of deity and spiritlore, prayer and sacrifice ("no evidence of an organized priesthood," only medicine men, shamans or jugglers), burial customs, mythological personages, etc. Mr Martin declares that "no ancestor-worship in any sense can be said to have existed among our tribes."
- Martinez** (B. F.) Os indios Guayanãs. (Rev. do Museu Paul., S. Paulo, 1902-1903, VI, 45-52.) Historical-ethnographic notes, with brief vocabularies. The solitary fishing expeditions of these Indians are remarkable. Inhumation is substituting the older urn-burial.
- Notes** on Panama and Colombia. (Nat. Geogr. Mag., Washington, 1903, XIV, 458-466.) Page 466 contains pictures of Talamancan Indians and their houses.
- Peary** (R. E.) Field work of the Peary Arctic Club, 1898-1902. (Bull. Geogr. Soc. Phila., 1904, IV, 1-48, 7 pl.) Contains *passim* a few notes on Eskimo.
- Pittier de Fábrega** (H.) Die Tírub; Tétribes oder Térrabas, ein im Aussterben begriffener Stamm in Costa Rica. (Z. f. Ethnol., Berlin, 1903, XXXV, 702-708.) Brief historical notes and abstracts of a few tales. The Terrabas numbered in 1824 some 1,000 souls, in 1898 only 57, with a great preponderance of males. Miscegenation with negroes and whites has taken place.
- Preuss** (K. T.) Phallische Fruchtbarkeits-Dämonen als Träger der altemexikanischen Dramas. Ein Beitrag zur Urgeschichte des mimischen Welt-dramas. (A. f. Anthropol., Brnschw., 1903, N. F., I, 129-188, 24 figs.) In this interesting and valuable monograph Dr Preuss discusses the old Mexican demons of harvest and spring, phallic ceremonies of the demons, the mimic drama in Mexico, beginnings of the *mimus* among the Iroquois and Pueblo Indians, the Græco-Italian *mimus* and the dramatic world-literature, the newly discovered *mimus* of the Oxyrhyncus papyri. The relation of *coitus* and birth to the mimic acts in the ceremonies of various peoples connected with spring, harvest, growth, fertilization, etc., are considered, the phallic basis of many demonstrated, and the rôle of *coitus* in the activity of many deities pointed out. Very curious is the

development of the phallic demon as actor, including the clowns of Shakespeare, descendants of the ancient mimic fools. The Karagoz of the Turkish shadow-play is phallic. The primitive mimic drama begins in magic and ends in the great world drama.

Prince (J. D.) and Speck (F. G.) Dying American speech-echoes from Connecticut. (Proc. Amer. Philos. Soc., Phila., 1903, 346-356.) Notes on the language of the Skaghticoke Indians of Connecticut. Three connected sentences and a glossary of 23 words are given, with comments and explanations. The Skaghticoke has the rare *r*-sound. It is a modern form of ancient Pequot-Mohegan speech, and the "Indians" have little aboriginal blood.

Ramirez (I. F.) Códices mexicanos de Fr. Bernardino de Sahagun. (An. d. Mus. Nac. de Méx., 1903-1904, 2^e ep., 1, 1-34.) Describes the Codices Castellano, Mexicano, the author and the fate of his works, various editions, etc.

Russell (F.) A Pima constitution. (J. Amer. Folk-Lore, Boston, 1903, xv, 222-228.) Describes (with text) the origin and development of a "constitution," an interesting product of white-Indian contact, by the Pimas of the Gila-Salt River valley in southwestern Arizona.

Spitzka (E. A.) The execution and post-mortem examinations of the three Van Wormer brothers at Dannemora, N. Y., Oct. 1, 1903. (Daily Medical, N. Y., Feb. 8, 1904, 4-6, 5 figs.) Gives anthropometric and cerebrometric data. No evidence of a "criminal type" of brain and no grave defects or malformations were observed. The youngest had the heaviest, the eldest the lightest brain. The form of brain was similar in all three. Variations normal. Brain-weights 1,600, 1,358, 1,340 gr., fresh; statures, 1,752, 1,780, 1,728 mm. Brain of youngest had well-marked postorbital

limbus. See *American Anthropologist*, N. S., vi, p. 307.

— Post-mortem examination of the late George Francis Train. (Ibid., Feb. 15, 1904, 2, 6 figs.) Gives measurements of cranium, head and face (no notable asymmetry), brain-weight (10 hours after removal) 1525.5 gr. = ca. 1600 gr. in middle-age. Cephalic index 81.3. Brain shows no lesion, deformity, atyp or anomaly, and exhibits "a superior degree of complexity in its surface morphology." Postorbital limbus well-developed on both sides.

Tooker (W. W.) Indian place-names on Long Island. (Brooklyn Daily Eagle Almanac, 1904, 409-410.) This revised and corrected list contains the significations of some 230 place-names of Algonquian origin, many of which now appear in more or less corrupt form. A number of the words recorded are personal names which have become place-names.

Townshend (R. B.) The snake dancers of Mishongnovi. (Nineteenth Cent., Lond., 1904, 429-443.) Religio-scientific inter-location.

Urbina (M.) Notas acerca de los "Tzauhtli" ó Orquideas mexicanas. (An. d. Mus. Nac. d. Méx., 1903-1904, 2^a ep. 1, 54-84.) Contains much information concerning Aztec names of orchids and their uses. A valuable contribution to ethnobotany.

Vogt (P. F.) Material zur Ethnographie und Sprache der Guayaki-Indianer. (Z. f. Ethnol., Berlin, 1903, xxxv, 849-874, 1 fig.) Brief notes on physical characters, ethnic names, implements, weapons, language, etc. Comparisons with Guarani and Tupi are made. Father Vogt credits the Guayaki of today with cannibalism (they esteem the brains of their enemies, the Kainguá, a dainty). The present Guayaquí habitat is on the Monday'.

ANTHROPOLOGIC MISCELLANEA

Identification of Some Græco-Egyptian Portraits.—The Græco-Egyptian paintings known as the Hellenic Portraits have engaged the interest of archeologists, artists, and art-historians since their discovery in 1887 and 1888. As is well known, they are bust-portraits, executed in encaustic or distemper, sometimes in a combination of the two, on thin panels of sycamore or cypress. They were intended to be portraits of deceased persons, and placed over the face of the mummy, being glued to the linen bandages which enwrapped the body. These paintings are ascribed to the Græco-Roman epoch of Egypt. From a religious-cultural point of view the portraits are an outgrowth from the ancient Egyptian custom of placing an effigy of the deceased at the head of the mummy or coffin in order to attract the *ka*, or spiritual double, to the body and thus preserve the individuality of the deceased. In early times this was not a portrait painted on the mummy case, but a molded mask decorating the head and end of it, while the lid of the case was shaped in imitation of the swathed corpse. Since the ninth century, B. C., the custom of encasing the mummy in a cartonage became general. On this cartonage shell the face of the deceased—a molded mask, gilt or colored—was usually placed. When Hellenism took root on the banks of the Nile and painters began to produce striking likenesses, a painting representing a real portrait of the deceased was substituted for the plastic head, with its mostly conventional features, as a habitation of the *ka*. The Hellenic Egyptians, and to a greater extent the Semites who are represented on these portraits, probably knew little of and cared less about the religious motive which had first required the attachment of an image to the mummy; but the custom appealed to their sentiment as a means and token of remembrance. The use of portraits on mummies is assumed to have continued until the edicts of Theodosius (392 A. D.) prohibited the worship of the genius to which the custom owed its origin.

Most of these portraits were found in the necropoles of Rubaiyat (the ancient Kerke) and Hawara, both places situated in the Fayum, the district which also yielded the largest supply of papyri. It was also in the Fayum, the ancient *nome*, or canton, of Arsinoitis, where, under the Ptolemies, the Greek element predominated. The portraits, however, are, as it were, international in their physiognomy. Besides Hellenized

Egyptians of Greek origin, they represent Græco-Egyptian half-breeds, others with an admixture of Ethiopian blood, and a rather large proportion of the Semitic race — Jews and Phœnicians. In all probability we have here a representation of the mixed population of cities. The paintings thus not only throw light on the pictorial technics of the Grecian artists, but also form a valuable contribution to anthropologic research, into what may be called the physiognomy of nations.

It has been noticed that most of the persons represented on the portraits appear to have belonged to a higher class. Many of the men wear aristocratic vestments, with laurel wreaths or gold fillets on the head and a ribbon across the breast, as indicating some office or station of dignity, so also the elaborate ornaments and jewelry worn by several of the women give evidence of superior rank.

Mr Theodor Graf, of Vienna, the owner of the largest and finest collection of these antique paintings from Rubaiyat (Kerke), believes that he has identified some of his portraits with those on coins, cameos, etc., which would show them to represent royal personages. According to this comparison, No. 4 of Graf's collection would represent Ptolemy Philadelphus, No. 5 Ptolemy Soter, No. 12 Queen Cleopatra, No. 15 Queen Berenice, No. 22 Ptolemy Philometor, No. 26 Ptolemy Euergetes, No. 28 King Perseus of Macedonia (compared with a bust in the Louvre), No. 43 Queen Cleopatra Tryphanea, No. 81 Queen Arsinoe. The finding of royal mummies and portraits in the remote Kerke (Rubaiyat) would be accounted for by some war or popular disturbance in Alexandria which might have prompted the removal of the royal bodies from their mausoleum to the secluded port in Middle Egypt, in order to protect them against plunder and desecration. In a letter accompanying the heliographs of the portraits in question, along with reproductions of the coins, Mr Graf cites, in support of his theory, several high authorities, among them the renowned paleographer Professor Julius Euting of Strassburg, and the painter, Professor Otto Donner von Richter of Frankfort.

We may be permitted to quote the closing remark of the late Professor Virchow in his paper on the subject (*Porträt-Münzen und Graf's hellenistische Porträt-Galerie*), read before the Anthropological Society of Berlin on May 18, 1901: "It was, in any case, a happy thought to adduce the coins for a comparison with the panel-pictures. The latter, executed in colors, afford without question a most clear illustration. They will preserve a lasting value not only for the history of the Ptolemies, but also for the ethnological knowledge of a period of Egypt so important for the development of culture. It would be of the greatest

importance for history if a whole series of the members belonging to a definite and, at the same time, so important a dynasty, could be presented to us in the color of the time and life." I. M. CASANOWICZ.

West Indian Researches. — Dr J. Walter Fewkes, of the Bureau of American Ethnology, has returned to Washington after four months' successful field-work in the West Indies. During the trip he visited Cuba, Jamaica, Porto Rico, Trinidad, and the Lesser Antilles, obtaining, from several localities, collections of prehistoric objects numbering several hundred specimens and including many varieties, some of which have not before been represented in the National Museum.

In the province of Santiago, Cuba, Dr Fewkes procured a small collection illustrating the stone-age culture of that part of the island. On account of the extreme rarity of prehistoric objects from Cuba, for the absence of which our museums have been noted, these objects are regarded as valuable additions. They belong, however, to an intrusive rather than to an autochthonous culture. It was found that at the time of the discovery the western and central parts of Cuba were inhabited by a very primitive people, with few arts, speaking a language different from that of the eastern provinces of the island, and whose culture was derived from neighboring islands. This primal Antillean population, also represented, at the time of the discovery, in the mountains of Haiti, was a cave-dwelling people who may be regarded as the oldest inhabitants of the islands; their kinship is unknown, for the few objects left by them are confused with those of later Indian occupants.

Dr Fewkes visited the larger of the Lesser Antilles, following the possible pathway of prehistoric culture migration from South America to Porto Rico, and special attention was given to the evidences of this culture on the several islands from Trinidad to St Thomas. A fair collection of prehistoric objects was obtained on Trinidad island, which formed the gateway of this culture migration, thus giving special significance to its antiquities. The survivors of the Trinidad Indians were studied by Dr Fewkes; these now reside at the old town of Arima, and while it was found that they had lost their native language, they yet retain some of their aboriginal arts.

Archeological collections were obtained also in Grenada, Barbados, and St Vincent, which lay in the way of prehistoric migration between Trinidad and Porto Rico. The collection from the island last named, which included that of Sr Eduardo Neuman, of Ponce, is particularly rich in unique stone objects from the southern and western ends. In ad-

dition to numerous duplicates, it contains six stone "collars" or rings, fifteen mammiform idols (several of which are among the finest yet discovered), stone masks, bird stones, amulets, and effigy vases. An old shrine in a cave at Cayuco, near Utuado, Porto Rico, yielded a small globular vase containing two strings of finely polished stone beads (one of the strings being six feet in length), as well as several sacrificial objects. A preliminary examination was made of some of the more important shell-heaps on the southern shore of Porto Rico, especially of the one at Cayito, near Santa Ysabel, and of others on the Rio Coamo. Several large shell-heaps were discovered more than five miles from the shore near the Coamo hot springs, the contents of which indicate that they were reared by a people using polished stone implements and finely painted pottery ornamented with relief decorations. Fragments of human bones associated with burnt wood and ashes were also found embedded in the shell-heaps.

Particular attention was given to pictography on the various islands, and to a comparison of forms and designs on aboriginal pottery. The prehistoric inhabitants of the Lesser Antilles, from Trinidad to Porto Rico, were found to be expert potters whose productions exhibit high artistic development. Dr Fewkes believes that he has gathered sufficient evidence to prove the existence in the West Indies of a cave-dwelling people who antedated a more advanced population. Survivors of this cave people lived in Cuba and Santo Domingo toward the close of the fifteenth century, but few evidences of them are now to be found, as their arts were simple and limited in scope. Side by side with the cave-dweller culture was a later and higher culture, dominant on the eastern end of Cuba, the germ of which came from South America and reached its greatest development, which was characteristic and unique, in Porto Rico and Santo Domingo.

Light is thrown by the material collected on the relation of the Caribs to the earlier inhabitants of the islands, both savage and cultivated. A description of these collections and their bearings on race migration and culture development will be published later by the Bureau of American Ethnology.

Some Brain-weights in the Negro Race.¹—Soon after the close of the Civil War the writer was one of three attachés of the United States Army Medical Museum to make a series of one hundred post-mortem examinations on the freedmen at Freedmen's Hospital, Washington. The brain-weights were taken in ounces and fractions of an ounce. In eleven

¹ Read before the Anthropological Society of Washington, May 3, 1904.

cases the weight was not taken, or at least was not recorded. These persons were not all pure negroes, but the record does not show definitely the proportion of admixture of white blood, and at this distance of time the memory fails on this point. It may be stated, for comparison, that the average brain-weight in white subjects, according to most anatomists, is about $49\frac{1}{2}$ oz. for men and $44\frac{1}{2}$ oz. for women — about 5 oz. difference between the sexes, due largely, of course, to difference in stature and body-weight. The brain-weight increases rapidly up to the seventh year, more slowly to between 16 and 20, still more slowly to between 30 and 40, at which time it reaches its maximum and afterward begins to decrease, losing about one ounce for each decade. Of course, in comparing the brains of whites with those of freedmen, it must be remembered that the freedmen had but recently been released from slavery, and slavery meant both the absence of education and of the opportunity for mental advancement except along narrow lines.

In 39 of the 89 cases (44 per cent.) in which the weight was taken, the weight was 45 oz. or more; in 10 cases (11 per cent.) 50 oz. or more, which is more than that of the average white brain. Twenty of the 89 individuals were less than 20 years of age. In two children 13 years of age the weight was 46 oz.; in one of 15 years it was $44\frac{1}{2}$ oz.; in two of 17 years it was $48\frac{1}{4}$ and 50 oz., respectively; in one of 18 years, $46\frac{1}{2}$ oz.; in three of 19 years it was $44\frac{1}{2}$, 45, and 48 oz., respectively. In three cases the weight was 50 oz., in one case $50\frac{1}{2}$, in two cases 51, in two cases 53, in one case 54, and in one case 56 oz. As stated above, these weights are above the weight of the average white brain.

In 17 cases the age of the individual was not noted, but was stated in the case of 43 men and 9 women, who were more than 20 years. In these latter the average brain-weight for men was 45 oz., for the women 39.7 oz., or a little more than 5 oz. difference.

Of five men 60 years old or more, the brain-weight was as follows: One man of 60 years, 40 oz.; one man of 71 years, $45\frac{1}{2}$ oz.; one man of 72 years, 42 oz.; one man of 89 years, $39\frac{1}{2}$ oz.; one man of 105 years, 41 oz. The last mentioned was named Washington, perhaps one of the old Mount Vernon slaves; his brain-weight was probably equal to that of the average white at this extreme age, although there are naturally few opportunities of obtaining brain-weights of centenarians. The ages given cannot, of course, be vouched for, especially as it is well known that at the time referred to the Negro was inclined to exaggerate his age after reaching 60 years.

Other things being equal, the brain-weight and the mental capacity,

in my opinion, bear a definite relation to each other ; and the facts above presented would seem to show a high degree of mental capacity in the negro.

D. S. LAMB.

The Wyoming Historical and Geological Society, of Wilkes-Barré, Pa., has lately doubled its ethnological collections by the gift of the valuable collection of Indian relics from the watershed of the Susquehanna, gathered through some years of work by Mr Christopher Wren, of Plymouth, Pennsylvania. The collection is exclusively Pennsylvanian and contains 7,000 specimens, many of the finest quality. One case, containing a small part of the relics, shows the crude brown flint, black flint, and red jasper, from quarries adjacent to Wyoming valley, with every stage of manufacture of the blades and arrowpoints from this material. The Society has also lately acquired by purchase the very rich collection of Mr A. F. Berlin, of Allentown, Pa., who has spent thirty years in its formation. Of the 3,000 objects in this collection, 1,200 are from the interior of Pennsylvania and the remainder from adjacent states. They consist of hoes and axes from half a pound to fourteen pounds in weight, agricultural blades fourteen inches long, discoidal or chungke stones of the finest finish, ceremonial and bird stones of polished banded slate, blades and knives of exquisite shape, and polished pieces of every variety of material and workmanship. This is the finest private collection the writer has ever seen. During the last year the Society has also created the "Zebulon Butler Collection," which now numbers a thousand local specimens, and two other small but excellent collections have increased the additions to the cabinets to more than 12,000 objects. The Wyoming Historical and Geological Society has what has been pronounced by Mr Stewart Culin the finest collection of Algonquian pottery in the United States, numbering fifteen whole vessels from the Wyoming Valley section.

HORACE EDWIN HAYDEN, *Corr. Sec'y.*

The Brain-weight of Dr Taguchi. — Dr Kazuyoski Taguchi, Professor of Anatomy in the Medical College of the Imperial University of Tokio, is perhaps the first of his race to bequeath his own body to his colleagues for the purpose of dissection. His work on the brain-weight of the Japanese is the most extensive yet published, and it is noteworthy that his own brain is the heaviest on record among the Japanese, namely, 1920 grams, or 67.7 ounces avoirdupois. In the list of eminent men (now 107 in number) it occupies second place, the brain of the Russian poet and novelist Tourgeneff (2012 grams) being the only one superior to it in this

respect.¹ The report of the post-mortem examination by Dr Yamagiwa, president of the University, mentions Taguchi's age as 66 years, and the body-weight as 108 pounds. Cirrhosis of the kidney with complications caused death.

EDWARD ANTHONY SPITZKA.

Stephen Powers, author of "Tribes of California," published in 1877 as volume III of *Contributions to North American Ethnology*, and of numerous articles on the Indians of California which appeared in the *Overland Monthly*, died at Jacksonville, Florida, April 2. Mr Powers was born at Waterford, Ohio, in 1840, and was graduated from the University of Michigan in 1861. At the time of his death he was editor of the *Florida Farmer and Fruit Grower* and agricultural editor of the Jacksonville (Florida) *Times-Union*.

DR C. V. HARTMAN, curator of archeology and ethnology in the Carnegie Museum of Pittsburg, has removed the collection of Costa Rican antiquities made by Padre José Maria Velasco from the archeological department of the Free Museum of Science and Art in Philadelphia to the Carnegie Museum at Pittsburg. This collection, together with another scarcely less important collection made by Padre Velasco, supplemented by the Troyo, the Ferraz, and other collections recently acquired by the museum, give this institution the largest assemblage of Costa Rican antiquities in existence outside of Costa Rica. In fact, the Carnegie Museum possesses more specimens of Costa Rican antiquities than are found in all the museums of the world put together.—*Science*.

INTERNATIONAL CONGRESS OF AMERICANISTS.—At the Fourteenth Session of the International Congress of Americanists to be held at Stuttgart, in August, Mr W. H. Holmes will represent the Smithsonian Institution, Dr Franz Boas and Prof. Marshall H. Saville the American Museum of Natural History, and Dr G. A. Dorsey and Dr C. W. Currier the Field Columbian Museum and the Catholic University of America, respectively. These gentlemen and the Duc de Loubat have also been appointed delegates on the part of the United States Government.

DR JUAN F. FERRAZ, the Director of the Museo Nacional of Costa Rica at the time of its consolidation with the Instituto Fisico-Geográfico Nacional at San José, died in February last. Dr Ferraz will be remembered for his interest in Central American archeology and ethnology. His last visit to this country was for the purpose of attending the session of the International Congress of Americanists at New York in 1902.

¹ See *American Anthropologist*, vol. v, No. 4, pp. 595-596, table; also "The Brain-weight of the Japanese," *Science*, Sept. 18, 1903, pp. 371-373.

THE SEVENTY-FIRST SESSION of the Congrès Archéologique de France will be held at Puy (Haute Loire), France, June 21-28. M. Eugène Lefèvre-Pontalis, of Paris, president of the Société Française d'Archéologie, is president of the congress, and M. A. Jacotin, of Puy, is general secretary. The subscription is 10 francs.

DR WALTER HOUGH, of the U. S. National Museum, is conducting archeologic researches in the little-known section of southwestern New Mexico, and MR STEWART CULIN, of the Brooklyn Institute of Science and Arts, is engaged in making ethnologic collections in the same territory.

AT THE RECENT council meeting of the American Anthropological Association, held at the American Museum of Natural History, New York, Dr George Grant MacCurdy was elected secretary of the association, *vice* Dr A. L. Kroeber resigned.

DR ALEŠ HRDLÍČKA, of the United States National Museum, has been elected a corresponding member of the Czecho-Slavonic Ethnological Society of Prague.

THE PUBLIC PRESS announces the death, at Cox rancheria, near Ukiah, California, May 25, of Charles Penio, the oldest chief of the Ukiah tribe. Penio was reputed to have been 107 years of age.

DR HENRY F. PITTIER has resigned the directorship of the Instituto Físico-Geográfico Nacional, of Costa Rica, and will spend the next few months in the United States.

PROF. EDWARD S. MORSE, of Salem, Mass., and Dr W. J. Holland, of Pittsburg, Pa., have been elected corresponding members of the Swedish Society of Anthropology and Geography.

MR ADOLPH F. BANDELIER has been engaged by Columbia University for next year as lecturer on "The Value of Spanish-American Literature for American Ethnology and Archeology."

DR W. C. FARABEE, instructor in anthropology at Harvard University, is to conduct a party of students on an anthropological trip through the southwest during the summer.

BEGINNING WITH the current year the *Archiv für Religionwissenschaft* has been edited by Dr Albrecht Dieterich of Heidelberg and Dr. Thomas Achelis, and published by B. G. Teubner of Leipzig, Germany.

CHARLES A. DILG, for many years interested in the prehistory of the vicinity of Chicago, died in that city April 29, aged 59 years.

THE INTERNATIONAL CONGRESS OF ARCHEOLOGY will be held at Athens in April, 1905.

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